

The Mining Journal

RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 731.—Vol. XIX.]

LONDON, SATURDAY, AUGUST 25, 1849.

[PRICE 6D.]

Greenwich Hospital—Sale of Lead Ore.

THE COMMISSIONERS OF GREENWICH HOSPITAL will receive TENDERS for the PURCHASE of EIGHT HUNDRED BINGS of LEAD ORE, at the Low Byer Inn, Alston, up to One o'clock in the afternoon of Thursday, the 6th day of Sept. 1849.—Samples of the ore will be forwarded to any parties wishing to purchase, who may not appoint agents to examine them, on application to Mr. Paul, Alston, Cumberland; and conditions of sale may be had on application to Mr. Gray, at the Greenwich Hospital Office, Dilston, Newcastle-on-Tyne.

WEST OF SCOTLAND MALLEABLE IRON-WORKS, AND LANDS OF BRAIDHIRST AND MILTON.

TO BE SOLD, BY PUBLIC ROUP, within the Royal Exchange Sale Rooms, on Wednesday, the 29th day of August, 1849, at One o'clock in the afternoon.

MALLEABLE IRON-WORKS.

These large WORKS, belonging to the West of Scotland Malleable Iron Company, situated at MOTHERWELL, in the parish of Dalziel, and county of Lanark, consisting of REFINERY FIRES, FORGE, RAIL ROLLING, SLITTING, HOOP, PLATE, and SHEET MILLS; And, with a little further outlay, capable of producing about 600 tons finished iron weekly.

These works, which have been erected on the most approved plan, have been in operation since May, 1847; and, besides rails, can be made to turn out all the sizes and varieties of iron usually required by the trade.

There are on the ground one blowing engine of about 80-horse power for refineries, two large and two mill engines, condensing and that work expansively, each about 100-horse power. Between the mill engines there is a small subsidiary high-pressure engine, of about 40-horse power, for driving the guide mills. There are likewise one lathe and one pumping high-pressure engine, each about 20-horse power. All these engines, with (as an exception, are in first-rate working order.

Attached to the works are sundry, wrights, and fitting-up shops, with turning lathes, cranes, &c., complete. Also, offices, stables, mill manager's house, and 98 workmen's houses, besides ample accommodation in the village of Motherwell, immediately adjoining.

These works are most favourably situated, being surrounded by coal and pig-iron works; and, as the Caledonian Railway forms one of the boundaries of the works, railway communication to all parts of the kingdom is afforded; and the works have a direct communication with the Harbour of Glasgow, distant 10 miles, by the Clyde Junction Railway. Upset price, £45,000.

LANDS OF BRAIDHIRST AND MILTON.

These lands, situated in the parish of Dalziel, and county of Lanark, lie contiguous, and extend in all to 390 acres, or thereby, but from that full to be deducted about 80 acres, set apart for the Malleable Iron Works, to be held under Feud, and about 20 acres occupied by the Village of Motherwell, also held under Feud—leaving about 340 acres to be disposed of, together with the Feud-Duties exigible from the portions fused as aforesaid, which Feud-Duties amount to nearly 3000. per annum.

The lands are most advantageously situated, being bounded on the south-west side by the turnpike road from Glasgow to Lanark, on the south-east by the turnpike road from Edinburgh to Hamilton, and on the north-east, north, and north-west sides by the River Calder; and being intersected by the Wishaw and Coatna Railway, now forming part of the Caledonian Railway, easy access and communication is afforded to all parts of the kingdom.

There is an excellent Farm-Standing on the lands, with Out-Houses and Cottars—Houses, sufficient for a large farming establishment; and, having been for some years in the hands of the proprietors undergoing improvements, the lands are in the best condition.

The lands contain MINERALS, and the purchaser will obtain right, not only to the minerals in the Unfeud lands, but also to a large portion of those under the Feud Ground.

The Coal has been wrought at a moderate depth for more than 12 months, for the supply of the Malleable Iron Works, and has been proved to be of excellent quality.

It is proposed to reserve to the Proprietors of the Malleable Iron Works a right to Feud about ten acres of additional ground, adjoining their works, at the rate of 60. per acre, (exclusive of Minerals, however), provided the option is exercised within a specified period. Upset price 25,000.

For further particulars, application may be made to Laurence Hill, Jun., at the works at Motherwell; James Anderson, at the company's office, 88, St. Vincent-street; or to Messrs. Paterson, and Forbes, 45, West George-street, Glasgow, in whose hands are the title-deeds and articles of roup, and plans of the property.

Glasgow, 21st July, 1849.

EXTENSIVE IRON-WORKS FOR SALE, BY PRIVATE BARGAIN.

THE BLAIR IRON-WORKS.

Belonging to the Ayrshire Iron Company, with the whole MINERAL FIELDS held by the said company, under favourable leases, including the MALLEABLE IRON-WORKS, immediately adjoining, so far as erected—all as particularly described in former advertisements.—There is a large STOCK of IRONSTONE on the ground, which may be had at a valuation.

For further particulars apply to Mr. Biggart, at the works; Mr. Watson, 32, and Mr. Brown, 35, St. Vincent-place, Glasgow; Messrs. McClelland and Mackenzie, accountants, there; Messrs. Gibson-Craig, Dalziel; and Brodie, W.S., Edinburgh; or Messrs. Montgomerie and Fleming, writers, Glasgow—the last being in possession of the title-deeds.

Glasgow, June 20, 1849.

COAL—TO BE SOLD, OR LET, either in one or more lots,

all that valuable VEIN of COAL, commonly called the UPPER MOUNTAIN MINE, extending over about 1000 acres—situate in the township of GREAT HARWOOD, in the county of Lancaster. The mine has been recently proved, and found, at 77 yards from the surface, to be 5 feet in thickness, and of an excellent quality. The above property is within a short distance of the Leeds and Liverpool Canal, and in the midst of a populous and large manufacturing district.

A section of the borings may be seen by applying to Mr. Boole, Rufford Hall, Ormskirk; or to Mr. Whittle, Charnock Richard, Chorley—to either of whom proposals may be sent.

VALUABLE AND EXTENSIVE MINES OF COAL AND IRONSTONE.

TO BE LET, ON LEASE, on most advantageous terms, the COAL and IRONSTONE under a very large tract of land, in the parish of RUABON in the county of DENBIGH, adjoining the Shrewsbury and Chester Railway.

The proprietors of the ESTATES on which the Ponkey and Aberderyn Iron-Works were formerly carried on, have made arrangements TO LET BOTH PROPERTIES TOGETHER, which will give the lessee the facilities to carry on a lucrative business—very rarely to be met with.

The COALS and IRONSTONE on these ESTATES may be raised at very much less than an average cost, and the quantity proved in them (besides what are under a very large portion of one of them, in which there is no doubt they will be found) is estimated will supply iron-works with materials to make 400 tons of pig-iron weekly for upwards of 30 years, as well as 50,000 tons of the much and justly-celebrated Yard and Wall and Bench Coals per annum for sale, for the same period.

Printed particulars of the property, and lithographed plans of the estates, showing the minerals under them, with calculations as to the expense of making iron from them, as compared with that of manufacturing it in Staffordshire, may be had upon application at the office of the *Mining Journal*, 29, Fleet-street; and at J. Boydell's, 54, Threadneedle-street, London; and at Messrs. Longville and Williams, solicitors, Oswestry.

Oswestry, June 6, 1849.

MINES IN FLINTSHIRE.—TO BE SOLD, BY PRIVATE TREATY, by order of the trustees of the late William Williamson, Esq., of Greenfield, SHARES in the following valuable and well-known MINES, in the county of Flint—viz. 1.—TALARGOCH, HENDRE, TALACRE, NANT, and PARRY'S MINE (HALKIN).—Most of the above mines are so celebrated, and have been so long established, that it is unnecessary to add a word in support of their claim to public attention.

ON SALE also, BY PRIVATE TREATY, a MOIETY of the COAL and MINERALS under about TWENTY-THREE ACRES of LAND, in GWESPYR, in the parish of LLANASA, now in the occupation of — Jones, Esq.

For information and particulars apply to Mr. Williamson, solicitor, Pendre, Holywell; Mr. William Williamson, solicitor, Well-street, Holywell; or to Mr. E. H. Williamson, Greenfield, near Holywell, Flintshire.

TO THE OWNERS OF COLLIERIES, MINES, PLANTATIONS, SAW-MILLS, &c.

IMPROVED CIRCULAR SAWS, MILL-SAWS, FILES, Machine Irons, and Cutting Knives, Steel in Blister, Bar, Cast, Sheet, and Drift Steel, Springs for Railways and Common Roads; Iron Washers, Bolts, Hammers, &c., on the most PERFECT and ECONOMICAL PRINCIPLES, MANUFACTURED with DISPATCH, by BLAKE AND PARKIN, THE MEADOW STEEL-WORKS, SHEFFIELD.

TO ENGINEERS AND BOILER MAKERS.—The

BIRMINGHAM PATENT IRON TUBE COMPANY MANUFACTURE PATENT LAP-WELDED IRON TUBES (under Mr. R. Prosser's Patent) for Marine, Locomotive, and all Tubular Boilers. Also, TUBES for Gas, Steam, and other purposes. All sorts of IRON GAS FITTINGS.

Works—Smethwick, near Birmingham.

LONDON WAREHOUSE—No. 6, Upper Thames-street.

WIRE ROPE.—The Undersigned beg to inform the public,

that they have become SOLE LICENSEES of MR. ANDREW SMITH, for the MANUFACTURE and SALE of his PATENT WIRE ROPE, and having fitted their premises with his very superior improved machinery, have only to assure those who may favour them with their orders, that the same care and attention shall always be bestowed which, they have reason to believe, has secured them such general support.

LIGHTNING CONDUCTORS, SIGNAL CORD, and SASH LINE, &c., in stock.

WILKINS & WEATHERHEAD, Patent Wire Rope Works, No. 39, High-street, Wapping, London.

JAMES BOYDELL, LAND, MINE, AND MACHINERY VALUER, AND AGENT.

No. 54, THREADNEEDLE-STREET, LONDON.

Has to dispose of

Several PATENT RIGHTS, FREEHOLD ESTATES, LEASES of FOUNDRY and ENGINEERING WORKS, FREESTONE QUARRY, and COAL and IRONSTONE MINES. SHARES in a well-known SLATE QUARRY, the PART, or the WHOLE, of a well-established GAS WORK, and STEAM-ENGINES and MACHINERY of all descriptions.

TO ENGINEERS, BUILDERS, AND ARCHITECTS.

JAMES BOYDELL, 54, THREADNEEDLE-STREET, having been a very large manufacturer of machinery and irregular shaped iron, and having accomplished the rolling of some descriptions of the latter, thought by many to have been impracticable, will be happy to ASSIST any ENGINEERS, SHIPBUILDERS, and ARCHITECTS, in the planning of the details of what IRONWORK they may have occasion for, or bringing to perfection any invention in machinery, as well as procuring such materials for the purpose as they may require.

DUISBURG IRON-WORKS AND MINES, IN WESTPHALIA, CLOSE TO THE RHINE.

Managed in England according to the principles of the "Cost-book System," and in Prussia as a *Société en Commandite*, under laws limiting the liability of the shareholders to their personal subscription.

Company's Office, 28, Moorgate-street, City.

INDURATED AND IMPERVIOUS STONE, CHALK, &c.

AGENTS, with capital, are WANTED in all TOWNS to SUPPLY (under British and Foreign Patents) the great demand for HUTCHISONISED MATERIALS—hard as granite, impervious to moisture, vermin, &c.: the cheapest and most durable for all buildings, hydraulic, paving, monumental and decorative work.—The profits are large.

Apply to HUTCHISON & CO., East Temple Chambers, London, or Tunbridge Wells, Kent; stating name, address, and capital at command.

N.B.—Houses cured of damp. The produce of soft stone quarries, chalk, plaster of Paris, wood, pasteboard, and all absorbent materials indurated to resist frost, vermin, &c.

LICENCES GRANTED.

LAMHEROEE WHEAL MARIA MINE.—At a General

Meeting of the adventurers in the above mine, held at the offices, King-street, on Thursday, the 23d instant.

PETER DAVEY, Esq., in the chair.

The circular of the pursuer convening the meeting was read by the secretary, James Crofts, Esq.

After the confirmation of the previous minutes, the balance-sheet was submitted, showing the liabilities of the mine to the end of June, £366 3s., and the assets (some of which doubtful), £945 19s. 2d.—leaving a balance in favour of the mine of £177 16s. 9d.

The shares in arrears of the last call, due 10th May, being reduced to a very small number, it was

Resolved.—That 15 days further time be given to each shareholder to pay the said call; and if not paid within the said date, the shares to be absolutely forfeited.

A report from the committee (a copy of which will be found in another column of the Journal) was submitted; it was also

Resolved.—That the second instalment of 10s. per share, out of £1 per share, made on the 8th April last, be now called, and payable on or before the 23d Sept. next.

The usual vote of thanks was passed by acclamation to the chairman, for his unremitting attention to the interests of the mine.

JAMES CROFTS, Secretary.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, BIRMINGHAM.—THE EXHIBITION OF WORKS OF MANUFACTURES AND ART, in connection with the ensuing General Meeting of this Association will be OPENED at BINGLEY-HOUSE, BROAD-STREET, BIRMINGHAM, on MONDAY, the 30th of September next.

The EXHIBITION will consist of SPECIMENS of ARTICLES of UTILITY and ORNAMENT in METALS, WOOD, and WOVEN FABRICS, MODELS of MACHINERY, and SCIENTIFIC APPARATUS, AGRICULTURAL IMPLEMENTS, and some INTERESTING PROCESSES of MANUFACTURE in OPERATION.

Members and associates of the Association will have free admission.

The public will be admitted on payment of One Shilling each person. Season tickets Five Shillings each.

Open from Ten A.M. until Ten P.M.

All CONTRIBUTIONS intended for the Exhibition must be forwarded immediately, addressed to the Exhibition Committee, Bingley House, Birmingham.

The carriage upon all articles which are accepted will be paid both ways by the committee, who will also insure the articles against fire; the committee cannot, however, hold themselves responsible for any damage which may occur to the contributions, in transit or in the exhibition, but the utmost care will be taken of them.

For FURTHER PARTICULARS apply to the SECRETARY, Mr. W. P. MARSHALL, Honorary Secretary, GEORGE SHAW, Secretaries.

Birmingham, August 15, 1849.

STRUVE'S PATENT MINE VENTILATOR.

TO COLLIERY PROPRIETORS

Quantity of air passed through a Mine almost unlimited, to the extent of 200,000 cubic feet per minute, if necessary—depending on size of apparatus.

No injury to pumps, tubbing, chains, ropes, or pitwork.

Cost kept clear.

Not influenced by barometrical and thermometrical changes in the atmosphere, or by wind.

Current of air undisturbed.

LICENCES will be GRANTED on application to Mr. WILLIAM PRICE STRUVE, C.E., Swansea.

The ventilator has been erected at the Eaglesbush Colliery, near Neath, and is perfectly efficient, and may be viewed on application to the proprietors, Messrs. Penrose and Evans, Neath.

CWMBRAIN PATENT IRON REFINERY.—The

PROPRIETORS of IRON FORGES and MILLS are respectfully INVITED to MAKE TRIAL of Mr. BLEWITT'S REFINED IRON, or METAL, PREPARED by a

NEW PATENT PROCESS.

whereby the IRON is completely FREED from the IMPURITIES CONTRACTED in the BLAST-FURNACE, and, by judicious mixtures, rendered applicable to every kind of manufacture. Heretofore, the metal usually sold in the market has been produced from the worst pigs, scraps, and refuse of some particular blast-furnace, or set of furnaces, without any mixture, or any regard to quality, or the purpose for which it might be required. The PATENT METAL IS PREPARED ON SYSTEM, and TO ORDER, for any of the following purposes:

1. For BOILER and TANK-PLATES.

2. For TIN-PLATES, commonly called COKE-PLATES.

3. For STRONG CABLE BOLTS, RIVET, and ANGLE IRON.

4. This COMPOUND PUDDLED, beat under the hammer into a bloom, reheated, and rolled into a 6 or 8-inch bar, makes TOPS and BOTTOMS for FLANCH and OTHER RAILS, of very superior quality, and attended with less waste than any other kind of iron used for that purpose. It is also well adapted for nail-roads, horse-shoes, and for other ordinary uses of the blacksmith.

The PATENT METAL is marked with a squirrel, and the initials "R. J. B.," and is to be had only at the "Cwmbrain Iron-Works," near Newport, Monmouthshire.

SMOKE NUISANCE.—TO ENGINEERS, MANUFACTURERS, MILLOWNERS, AND OTHERS USING STEAM BOILERS.

COLLINS' PATENT STEAM BOILER APPARATUS

CONSUMES SMOKE.

SAVING OF FUEL GREAT (full 30 per cent.)

GENERATING STEAM UNQUALIFIED.

NO ALTERATION in usual SETTING of BOILERS, and cost of apparatus and fixing trifling.—Also,

WATTEAU'S PATENT FOR PREVENTING INCORUSTATION in BOILERS, now used extensively, and with the best results.

References given, and plans forwarded, on application to James Buckingham, Esq., C.E., No. 13, Judd-place, New-road, or J. W. Gracbrook, agent, Bull Wharf, Upper Thames-street, London.

BEST STAFFORDSHIRE and LONDON-MADE BOILERS, warranted, and supplied on the lowest terms; prices forwarded, by addressing J. W. Gracbrook, Bull Wharf, Upper Thames-street, August 4, 1849.

NOTICE.—WENHAM LAKE ICE SUPERSEDED!

(BY ROYAL LETTERS PATENT.)

MASTERS AND CO.'S PATENT SHERRY COBBLER

FREEZING AND COOLING JUG.

By this Patent Jug, spring water is congelated into the purest ice, on the table or side-board, for Sherry Cobblers, &c., in FIVE MINUTES, at the cost of Twopenny. The public is respectfully invited to see the process of this extraordinary and useful invention, as actually BOILING WATER CAN BE CONVERTED INTO ICE without the aid of ice!

Patentees of the Freezing Machines (by which 20 to 100 quarts of Desert Ice can be made in a few minutes, and Rock Ice at the same time, and Wine cooled), Cooling Decanters, Refrigerators, Butter Coolers, and Percolators. By this last-mentioned article a bottle of wine, &c., can be cooled in a minute without ice, for one halfpenny.

MASTERS & CO.'S IMPROVED APPARATUS FOR MAKING PURE SODA WATER, LEMONADE, NECTAR, and all ERATED WATERS.—This apparatus needs only to be seen to be appreciated. Price 30s.—MASTERS & CO., PATENTEEES, 294, REGENT-STREET, and 7, MANSION-HOUSE-STREET, CITY.—Also,

BY ROYAL LETTERS PATENT.

MASTERS & CO.'S PATENT ROTARY BUFF KNIFE CLEANERS, which will clean and polish, equal to new, twelve knives in five minutes, without noise or dust.

The various processes shown at Masters & Co.'s Show Rooms, 294, Regent-street, and 7, Mansion-house-street, City, and may also be seen at the Royal Botanic, Zoological, and Coliseum, Regent's-park, and the Polytechnic Institution, Regent-street.

294, REGENT-STREET, and 7, MANSION-HOUSE-STREET, CITY.

WANTED.—An experienced ASSAY and SMELTING MASTER, to SUPERINTEND a TIN SMELTING ESTABLISHMENT. No one need apply whose character and qualifications will not bear the strictest scrutiny. Address to Mr. Joseph Drew, St. Austell, Cornwall.

TO ENGINEERS, CONTRACTORS, AND OTHERS.

WANTED.—A RE-ENGAGEMENT by a MANAGER and DRAUGHTSMAN, or CLERK of WORKS, who has had about 20 years' experience in the Designing, Construction, and Erection of Engines, Millwork, Machinery, &c., Superintendence of Workmen on heavy Works.—Would not object to superintending the erection, repairs, or making of engines, or the working of contracts.—Testimonials as to high abilities, qualifications, &c., will be given.—Address Mr. Hughes, Mount Pleasant, Nottingham.

TO PATENTEES AND IMPROVERS OF SMELTING

OPERATIONS.—The PROPRIETORS of PATENTS, or IMPROVEMENTS, in TREATING and SMELTING METALLIC ORES, and especially of LEAD, ARGENTINE LEAD, and COPPER, are invited to TRANSMIT to me, for investigation, the details of their SPECIFICATIONS and PROCESSES, whence mutual benefits may arise. Operative smelters, communicating the details of their avocations, will be eligible, in rotation, to permanent and lucrative employment.—Address (post-paid) William Radley, Esq., chemical engineer, Turinague, Canton de Valais, Switzerland, confidentially. Leetschen Mining and Smelting Works, Valais, Switzerland.

London, August 20, 1849.

TO ENGINEERS AND IRONFOUNDERS.—PARTIES

desirous to FORM a BRANCH in BIRMINGHAM, to their present business, may PURCHASE, on moderate terms, an ENGINEERING BUSINESS, of 20 years standing, now in full work, with patterns, lathes, &c. (plant about £2000).—Apply, 9 Box, Post office, Birmingham.

TO COAL AND IRONMASTERS.—WANTED, A SITUATION

as GROUND BAILIFF, or MINING AGENT, by a person practically acquainted with the different modes of getting Coal and Ironstone, and accustomed to Surveying, Mapping, and the General Management of a Colliery, and can be well recommended from his last situation, and by gentlemen in the trade of the highest respectability.—N.B. No objection to go abroad.—Address "W. S.," care of Mr. W. Timpson, bookseller, Hanley, Staffordshire.

IMPORTANT AND VALUABLE SLATE QUARRY, IN

CARNARVONSHIRE, TO BE LET, for term, and on such conditions as may be agreed upon. The above quarry is situated within six miles of Bangor, and within half a mile of the celebrated Penrhyn Quarry, being, without the slightest doubt, of the same vein and metal. The undertaking would suit a joint-stock company, or a private speculator, as it can be brought into early and extensive work, at a comparatively small outlay.—For particulars apply to Mr. Elias P. Williams, Queen's Head, Borthesda, near Bangor.

CHARCOAL ON SALE—ONE POUND PER TON, in

large quantities. OGDEN BROTHERS, Sunderland.

MINING PROPERTY.—MR. JAMES HERRON, MINE

AGENT, 33, CLEMENTS-LANE, LOMBARD-STREET, has received instructions to DISPOSE of SHARES in FIRST CLASS MINES, paying regular dividends, and yielding to the purchaser from 174 to 25 per cent. upon his outlay. He is also in a position to transact business in the following—viz.: United Mexican; St. John del Rey, Copalco, Alton, Tincroft, South Tamar, Treleigns, Linares, Santiago, East Rose, Treleway, Mary Ann, Holmbush, South Francis, Stray Park, Great Consols, Great Devon Consols, West Caradon, and Condoruv Mines.

MR. HENRY VATCHER, MINING AND RAILWAY

SHAREBROKER, EXETER.

Competent and experienced AGENT'S provided to INSPECT MINES, at the shortest notice.

MR. C. S. RICHARDSON, CIVIL ENGINEER, LAND

AND MINING SURVEYOR.

No. 15, OLD BROAD-STREET, CITY.

JAMES LANE, MINING SHARE DEALER,

80, OLD BROAD-STREET, LONDON.

BERGWESSIN SILVER-LEAD MINES.—Notice is

hereby given, that, in conformity with the resolution passed at the meeting of shareholders held this day, the directors have made a CALL of TWO POUNDS per share, payable by equal instalments of £1, on the 1st Sept. next, and 1st Jan., 1850, at either of the under-mentioned bankers:—The London and Westminster Bank, London; the National Provincial Bank of England, Brecon.

By order of the directors, W. C. SPILLER, Secretary.

Offices, 80, Basinghall-street, August 15, 1849.

BEDFORD UNITED MINES.—DECLARATION OF

DIVIDEND.—Notice is hereby given, that a DIVIDEND of FIVE SHILLINGS per share on the shares of these mines, will be PAYABLE at this office on Friday, the 31st August inst., and on every succeeding Friday, between the hours of Eleven and three o'clock.—Those parties who have not registered their scrip certificates, are requested to leave them at the office two clear days, in order that they may be examined and cancelled, and on the parties signing the Cost-book, agreeably to the resolutions passed at the General Meeting, held on the 9th Dec., 1847, the dividends, due 31st March, 22nd Dec., 1848, and 31st August inst., will be paid to them.

By order of the meeting of adventurers, G. KIECKHOFFER, Secretary.

50, Threadneedle-street, August 24, 1849.

CAMBORNE CONSOLS MINING COMPANY.—NOTICE

OF CALL.—Notice is hereby given, that the directors have this day resolved that the subscribers, or shareholders, in this company PAY, and they are hereby required to pay, on or before the 25th day of Sept. next, into the bank of Messrs. Frost and Co., 189, Fleet-street, London, a CALL of ONE POUND upon each and every share held by them in this company, and that, pursuant to article 116 of the company's Deed of Settlement, all and every share, or shares, upon which the said call of £1 per share shall not be paid within 14 days after becoming due, will be subject to absolute forfeiture.

By order of the board of directors, (Signed) H. L. T. VON USTER, Secretary.

DERWENT MINES OFFICE, 34, Dowgate-hill, August 2,

1849.—Notice is hereby given, that the directors of the DERWENT MINES COMPANY will be ready on Thursday, the 30th day of August inst., at Twelve o'clock at noon precisely, to RECEIVE, at this office, TENDERS for 1830 SHARES in the said company (represented by the 366 certificates of five shares each, numbered as below), on which the call of 30s. per share, due on the 14th July last, has not been paid. No tender can be received for less than the amount of the call so due.

The numbers of the certificates are as follows:—Nos. 85 to 58, 243 to 248, 407 and 408, 605 to 616, 633 to 676, 849 to 858, 913 to 945, 950 to 988, 1001 and 1002, 1032 to 1300, 1346, 1359 to 1367, 1377 to 1379, 1400 to 1430, all inclusive.

GUADALCANAL SILVER MINING ASSOCIATION.

Notice is hereby given, that a SPECIAL GENERAL MEETING of the shareholders in this association will be HELD at the offices, 34, Broad-street-buildings, Wednesday, the 12th day of Sept. next, at Two o'clock precisely, to take into consideration and determine upon the raising of capital for the erection of dressing machinery, a steam-engine for winding, crushing, and stamping, and further developing the mines and newly-acquired pertinences, and to authorise the directors of the company to take all necessary steps for the purpose.

By order, H. T. RYDE, Secretary.

34, Broad-street-buildings, London, August 22, 1849.

WEST DOWNS MINE, WHITCHURCH, near TAVI-

STOCK.—We hereby give Notice to all persons whomsoever, NOT to SUPPLY GOODS on CREDIT, or suffer any DEBT to be CONTRACTED with them, on our account, in respect of the above mine, by any person or persons whomsoever, as we are not accountable for any debts which have been, or may be, contracted in respect of the said mine.

THOMAS HARRISON, ALFRED WEATHERHEAD, J. D. DOW, BRIGHTMAN, as trustee, G. THOMAS.

London, August 24, 1849.

BICKFORD'S PATENT SAFETY FUSE.—The Patentees

of the ORIGINAL, and only real, SAFETY FUSE, beg to inform Merchants, Mine Agents, Railway Contractors, and all persons concerned in Blasting Operations, that, for the purpose of protecting the public in the use of a genuine article, the PATENT SAFETY FUSE has now a thread wrought into its centre, which being patent right, infallibly distinguishes it from all imitations, and ensures the continuity of the gunpowder. The Safety Fuse is now protected by a Second Patent, and manufactured by greatly improved machinery.

BICKFORD, SMITH, & DAVEY, Cambrone, Cornwall.

VIVIAN'S PATENT MACHINE, FOR DRESSING ORES

OF GOLD, TIN, COPPER, LEAD, AND OTHER PULVERISED ORES.—MR. THOMAS BOUNDY, of 13, Somerset-place, SWANSEA, begs to inform the proprietors of foreign and other mines, that he has been appointed AGENT for the SALE of these MACHINES—a model of which may be inspected at

THE PRINCIPALITY OF WALES

BRIEFLY CONSIDERED, WITH REGARD TO ITS PHYSICAL FEATURES, SOCIAL CONDITION, AGRICULTURAL CAPACITIES, GEOLOGICAL STRUCTURE, AND MINERAL RESOURCES.—NO. III.

BY JOSEPH HOLDSWORTH, ESQ., M.G.S.F., &c.

(Continued from last week's Mining Journal.)

In this place we are tempted to offer, *en passant*, a few cursory remarks on the healthy and fashionable watering place of Aberystwith, and which derives no small benefit from the adjacent mines. This town, which is better built, and of a more cheerful aspect, than the generality of Welsh towns, is situated, for the most part, on a slight elevation, at the extremity of the vale of the Rheidol; here, bordered by ranges of lofty green hills, of abrupt but pleasing conformation, which, screening Aberystwith from E.N.E. and S.S.W., respectively terminate on the shores of the ocean, in high rocky cliffs and bold escarpments. Between these prominent points a little bay indents the shore; its pebbly beach—which abounds with a great variety of valuable stones—forming a regular and graceful semicircle; opposite to which, the Marine Terrace, composed of some 60 well-appointed lodging-houses, and a handsome and commodious hotel, constitutes a noble sweep, closely following the curvature of the beach, and possessing in front a promenade of considerable extent and beauty. Every facility is offered here for sea-bathing, and there are some excellent public baths at the northern extremity of the terrace. A fine chalybeate spring exists in the immediate vicinity of the town. There is also a handsome suite of public rooms, consisting of a ball, promenade, card, billiard, and reading rooms.

The ruins of the once formidable Aberystwith Castle are paramount objects of interest to the visitor, and the grounds, which are now kept with much neatness, afford, for their inviting gravel walks on the elevated rock-bound promontory (the grass-clad knolls of which they intersect in all directions), some very extensive land and sea views. From this central position the coast is seen, forming a vast irregular curve, extending from the Island of Bardsey and projecting county of Carnarvon to the north, and Pembroke to the south—Cardiganshire and Merionethshire comprising the intervening portions. In clear weather the mountains of the Carnarvonshire peninsula are distinctly seen, constituting a most picturesque outline along the northern shores of this magnificent bay, and the lofty peaks of Snowdon and Cader Idris, with their serrated rocky dependences, present to the right a sublime array of Alpine scenery. Aberystwith, with its mountainous neighbourhood, possesses, in fact, many most inviting and novel attractions—to the English tourist especially, whether induced to visit it for health or recreation.

Passing from the more metalliferous regions of Cardiganshire, into North Wales, we immediately encounter the formidable mountain ranges, alluded to in speaking of the physical features of the country, extending east and west, from the towering saddle-shaped Arran Gessel, on the banks of the Dovey (along the Berwyn range), to the north-eastern extremities of Montgomeryshire, and which also stretch northward of this line of demarcation into Snowdonia. The slate mountains of these districts are of a more compact and uniform structure, often affording roofing-slate, &c., of an excellent quality; they also are occasionally intersected by lodes of lead and copper. Some very good veins of these ores have lately been found in the neighbourhood of Aberdov, &c., and at the eastern extremity of this rugged, slaty tract, near Llangynog, Montgomeryshire, a lead mine, called Craig-y-mwn, was discovered in 1692, of so remarkable a character, that it merits particular mention. The vein of ore in this mine was three yards thick, and formerly yielded annually 7000 tons, producing a clear profit of upwards of 35,000*l.* In the immediate vicinity of the mine are some extensive slate quarries, which supply the neighbourhood with considerable quantities of coarse slate. Copper, zinc, calamine, manganese, and limestone are also wrought in this country.

We must here not omit to particularize an important group of slate-quarries, the most southern of the kind in Wales, situated about two miles to the south of Cader Idris, near the road leading from Machynlleth to Dolgelly. As it may serve to exhibit the character as well as the local and commercial importance of such undertakings, we may be excused here entering into a few brief particulars respecting them. The works, situated on the left of the road leading to Dolgelly, may be respectively named as they occur, nearly in a direct line, and a few score yards from each other, in the same excellent workable vein, which has been proved to trend across the mountain slopes on which the quarries in question are opened—viz.: Cech Coch, Gaewern, Tyn-y-cennant, and Tyn-y-berth. The Gaewern quarries, the property of R. Rowlands, Esq., were the first opened of the above series, and have now been in active operation for several years past: at the present period, they are capable of producing about 120 tons of slates and 120 tons of slabs per month, and they give full employment to nearly 100 men. The chief characteristics of the materials from this slate vein, which is of a deep intense blue colour, are density, strength, and extreme durability; it has been made choice of for roofing the National Gallery. The supply may be said to be inexhaustible; the vein, which has been found of an unusual thickness in the Gaewern Quarries, has recently been proved by the works in active progress on the Tyn-y-Cennant property to be of increased width, with a quality of material unrivalled. In the upper reaches of the vale of Corris, and nearly opposite to these works, are the extensive quarries of J. Jones, Esq., employing above 80 men.

Amongst the multiplicity of purposes for which slate has been employed within the last few years, there are none to which more interest, or growing importance, may be justly attached, than its peculiar adaptation to ornamental uses. To T. E. Magnus, Esq., whose Ornamental Slate-Works are situated in Pinlloe, we are indebted for the first introduction of this useful and elegant art to public notice. An inspection of the various articles contained in his warehouses will afford abundant demonstration of the truth of his own declaration—that “slate, like porcelain, may be got up in various styles, from the simplicity suitable to a cottage, to the costly elegance required in a palace.” As regards its more general adaptation, amongst a vast variety of purposes particularised by Mr. Magnus, we may enumerate—cisterns, mangers, baths (enamelled inside as china), billiard tables, enamelled tombs, monuments and mural tablets, washstands and dressing table tops, salting vessels, portable filters, mouldings and coverings, plain and enamelled. Of the more *recherché* kind, he furnishes enamelled slabs for tabletops, consoles, pedestals, chimney pieces, &c., in imitations of Florentine, mosaic, and other costly and inlaid works, as also in the most beautiful and correct representations of rich and rare specimens of marbles, of which natural material they are not only one-third of the price, but are found to be stronger, stand heat and weather better, and are less liable to chip. The colours and polishes being rendered permanent by heat, it became a desideratum with Mr. Magnus to select the slate material, which, on efficient trial, might prove itself best adapted for this especial purpose; and he ultimately determined on the permanent use of the slate supplied by the above-named quarries, where, adjacent to Mr. Jones's Aberlleflyn quarries, he has established extensive works. Mr. J. George, of 43, Edgeware-road, London, has also selected this slate for the first essays in his important patented invention of erecting fire-proof houses, &c.—models of which he is now engaged in constructing near the quarries. By the conjoint employment of slab-slatings and iron (his sole materials), he states that houses, shops, warehouses, churches, chapels, monuments, lighthouses, and buildings of every sort and description, can be most economically erected in the best architectural forms, in the strongest and most compact manner, and in the shortest possible time, and also, so as to be at all times perfectly secure from fire. It is hardly necessary to observe that, when this “new system of building” becomes duly known and appreciated, it will incalculably contribute to the development of our national resources, and open a new and never-failing field to mechanical labour and commercial enterprise; indeed, whensoever it becomes the “fashion of the day,” slate quarries and iron mines will be estimated, and eagerly sought after as the true Golcondas of the country.

The village of Corris, which a few years ago was but a miserable mountain hamlet, has already, solely in consequence of the opening of this group of slate quarries, risen into a place of considerable importance; a national English school has been founded; another, together with a handsome church, is about to be erected, and a railway will shortly be laid down from hence to the port of Aberdov.

It may be needless to remark, that the returns yielded by a good slate quarry far exceed almost every other species of investment, commonly producing a clear profit of from 50 to 90 per cent. and when the risk attendant on the opening of the rock (often an expensive process) is surmounted, and the quality of the slate vein proved; the speculative character of the undertaking disappears, and it forthwith becomes a solid and *bona fide* channel for the permanent employment of capital.

The geologist recognises mica slate, talcous slate, flinty slate, and com-

mon or clay-slate; but of these, the last only is a material of extended use in the arts of building and construction. All of these varieties of slate are found alternating with each other in the same rocks in North Wales; hence the varied qualities of slate often discernible in the same mountain. The common, or clay-slate, abounds in the most rocky districts, and is found lying upon granite, gneiss, or mica slate. It very generally exists in beds or beds of various thicknesses, bounded by the coarser kinds of slate. Its laminar texture admits of a ready separation into thin plates, and thus endows it with a supreme value for roofing and other purposes, in which great density and comparative impermeability are required to co-exist with a minimum thickness and weight. All the more compact, finer, laminated, crystalline slate-rock invariably splits in a transverse direction to that of the beds, making with that direction an angle of about 60 degrees, and it has frequently two distinct cleavages. This peculiarity of structure is now considered to have been effected by crystalline action, or by polar forces—i. e., magnetic currents, having modified the whole mass, acting upon it in given directions, and with adequate power.

On the northern verge of the tract of slate mountains we have just been considering, and immediately across the beautiful verdant vale of Tallylyn, we here first come in contact with basaltic rocks, the stupendous piles of its porphyritic trap, or greenstone, felspar, and clinkstone masses, rising precipitously up from the vale, constitute the majestic mountain of Cader Idris. From this pre-eminent point a chain of primitive mountains, more or less broken by intervening slate rocks, trends in a north-north-east direction through Merionethshire into Snowdonia, where we meet with extensive formations of hornblende, schistose, mica, porphyry, and granite—the basaltic, porphyritic trap, and greenstone predominating in the western Merionethshire portion of the range.

The districts for the most part included in, and more immediately adjacent to which, are not considered as, strictly speaking, metalliferous, but the several important discoveries of metallic ores made therein, within the last few years, would appear to invest them with strong claims to the designation. Excellent lodes of copper, &c., have been found in the neighbourhood of Barmouth, and a copper mine of high promise, called Caemaision, has recently been commenced a short distance to the eastward of it. Some years ago a remarkable cupreous deposit was accidentally found to exist in a rather extensive bog, or turbary, situated a few miles to the north-east of Dolgelly. On the whole of the bog turf being dug up, and submitted to a smelting process, it is said to have yielded 7000*l.* worth of copper ore! In the same boggy tract several large masses of native copper were found embedded in the soil. Several attempts were subsequently made to discover the source, or lode, where the parent copper deposit was supposed to exist *in situ*, in the adjacent mountains, from whence the ore found in the bog must have originated, being conveyed there in a state of solution by the mountain springs or streams; and but lately these researches have been rewarded by the discovery of a very rich lode of copper. On a grant, consisting of 12,000 acres, the property of H. Richardson, Esq., of Aber Hirnant House, near Bala, which has recently been subjected to the minute investigations of eminent mineral surveyors, several valuable lodes of lead and copper have been discovered, and, in some instances, traced to very considerable distances on their line of direction; one of these east and west lodes, which is already producing rich ore in the new openings, has been distinctly traced to, and identified with, the Langynog Mine, already mentioned as being situated on the north-eastern borders of Montgomeryshire, and, at the present period, realising to the proprietors about 30,000*l.* per annum. The grant, containing the latter mine, lies adjacent to Mr. Richardson's extensive and valuable metalliferous tract of mountain land, and which, it may be remarked, is occasionally intersected by massive ranges of limestone.

At Dinas Mowddu, Cech-Coch, the recent discovery on the property of J. Hartley, Esq., and at several other places in the county, some excellent lodes of copper and silver-lead ore are being worked. At the former place, smelting-works, in connection with the mining companies of that locality, are about being established. But the most surprising results realised by recent enterprise in this part of the country are the Cwmheisan Gold Mines, situated on the banks of the River Gain, about eight miles from Dolgelly. The *sett*, which is of considerable extent, contains many veins and lodes of metallic mineral matter, comprising argentiferous lead, sulphurets of zinc, iron, and some copper, arsenical pyrites, and gold disseminated through all, but chiefly in the zinc and lead ores in a granular state; the matrix being chiefly indurated trap, with quartz and carbonate of lime. On the eastern portion of the grant, 14 lodes have been discovered, running, for the most part, in a north-west and south-east direction and from some of which, at a depth of about 15 fms., several hundred tons of ore have been raised, all containing gold. At and about the intersection of the lodes, on the east side of the river, all appear to form one vast lode, of upwards of 40 feet wide, from which ore may be taken with great ease, chiefly blende, but still mixed with gold. The average produce of gold from this part of the mine was something less than 16½ ozs. per ton; but on assaying chosen stones of ore (on which the gold sometimes appears as a superficial efflorescence) as much as at the rate of 500 ozs. of gold per ton were obtained. The predominating rocks of this district are of the clay-slate formation; but they are almost everywhere intersected by vast dykes and masses of porphyritic trap, chiefly of the green and grey stone character. The present spirited proprietor of the Cwmheisan Mines, who, for their effective working, has erected some really magnificent apparatus, purchased the grant of the original possessor for about 14,000*l.*

On one of the lower ridges of Cader Idris, an inferior kind of plumbago has just been discovered in a clay-slate formation; the operations are as yet but very partial, but as the requisite metallic lustre appears to increase as the level penetrates into the deeper portions of the dark carbonaceous bed enclosing it, a sanguine belief exists that the present spirited efforts will be ultimately crowned with success; if so, it will be the first discovery made in Wales of this invaluable mineral. In concluding these very brief and imperfect notices of the metalliferous treasures of Merionethshire, we must not omit to mention that veins of black specular iron ore are occasionally met with; the skirts of Cader Idris afford some thick beds of a rich magnetic iron ore.

In the upper part of the beautifully picturesque Vale of Festiniog, we find the second important group of slate quarries. The slate is of a fine, close, flexible quality, of a light blue colour, and obtains a very ready sale. It exists in mountain masses, and beds of various thicknesses, often enclosed between the trap, or greenstone, abounding in this neighbourhood. Sometimes very thin strata, or veins, of these rocks are seen intruded between the beds of slate rock; when this is the case they are found to injure the slate, and destroy the cleavage of its structure for a considerable breadth. They are commonly removed by blasting, but form a very expensive impediment to the operations of the slate miner. These extensive and most profitable quarries are said to afford employment to upwards of 2000 men; and here, again, we behold on every hand the rocky region decked and gladdened by the usual concomitants of such spirited undertakings. A commodious modern built church looks down from its lofty site with benignant aspect on the neat white dwellings, which are thickly scattered around; and a railway is observed cleaving the rocky heights, piercing through mountain buttresses, and taking its devious course through dark hanging woods on its way to Port Madoc—a pretty, clean, little, modern town, seven miles distant, containing many well-built residences, almost wholly occupied by English connected with the quarries, and to which, in fact, the town may be said to owe its existence.

In the wild basaltic region to the south-west of the above vale, and five miles from Harlech, is the romantic lake Cwm Bychan, which merits a place in this partial enumeration of natural products, from the circumstance of a very peculiar deposit of a pure snow-white earth being recently found to cover the entire bottom of the lake to a depth of many feet. It is found, on analysis, to be composed of silica and magnesia, is said to possess the properties of kaolin, or porcelain clay, forms an excellent base for pigments, imparts the highest polish to metallic substances, and is believed to be very generally applicable to the arts and manufactures. The lake is closely surrounded by a magnificent amphitheatre of rugged trap rocks.

But Science, with her Argus eyes, has just discovered, in the hitherto almost worthless peat bogs of mountainous regions, a new source of wealth, and a wide field for manual labour. Jasper W. Rogers, Esq., C.E., has recently patented his discoveries in peat moss, as convertible into a superior kind of charcoal, to be applied as a consolidator and deodorizer of the solid matter of the London sewers, and thereby converting it into a conveniently transportable manure of the most powerful description. His practical demonstrations of the process have proved eminently successful; but, independent of its power of fertilization (either in its individual state, or its intimate intermixture with animal excrement, by which process all the gases of the latter are instantly absorbed, and effectually retained for the demands of vegetable development), the dense condition in which peat char-

coal can now be readily produced, peculiarly adapts it for the making of “charcoal iron,” which hereafter may, probably, be manufactured in sufficient quantities to supersede the necessity of introducing foreign iron of that superior description into the country. Thus, the extensive turbaries and iron mines of Wales, can be brought to exert together an important part in her amelioration and prosperity, and present another striking illustration, that the beneficent Author of the Universe designed all natural productions, when rightly used, as benefits and blessings to his creatures.

In the immediate vicinage of Snowdon several valuable metallic lodes are known to exist. In the pretty romantic Vale of Llanberis, at the northern base of this monarch of Welsh mountains, there are some extensive copper-works; and in the Vale of Llanelly-frie, on his western skirts, is a mine of this metal, yielding at the present period 120 tons of ore a month.

About two miles lower down this vale, another assemblage of slate quarries is to be seen, and which may be said to be the first in this direction, worked in what is termed the Bangor vein. The colour of the slate-rock here is that reddish purple tinge so peculiar to the slate of the Penant quarries, and, like it, is remarkable for its extreme suppleness, tenacity, and ready divisibility into *laminae* of any required thickness. The more capacious of these quarries—although sometimes considerably encumbered with rubby beds and posts, and though the material has in some instances to be hoisted up to the surface from a depth of 50 or 60 yards by powerful steam wrought machinery—are respectively yielding clear profits of several thousands a year, according to the number of men employed, and the magnitude of the operations. A tram-road of eight miles in length is laid from the pits to the port of Carnarvon. The other considerable groups of quarries are situated on the Penryn estates and at Bangor—in the whole of which several thousand men are commonly employed. Above 150,000*l.* are said to have been expended at the former in railroads, and other improvements, for the transit of the slate to the port. The profits of the latter works alone are understood to amount to about 80,000*l.* per annum. Notwithstanding the number of quarries which have of late years been opened, it is found that the supply is scarcely adequate to the demand—a circumstance which, however, can excite little or no surprise, when we reflect on the extensive purposes for which slate is employed in Great Britain, and also that most extensive exportations of it are almost constantly taking place from this country, both to the continent of Europe and to America. The Liverpool merchant is known to clear a handsome per centage by his transshipments of this material to the United States, where, at New York, New Orleans, &c., our roofing slates are in great request. The freightage across the Atlantic is usually about 16s. or 18s. per ton for slates. Thus, in these quarrying undertakings alone, by the enterprise and perseverance of public spirited individuals, have the most barren and uninviting tracts become the certain and ready source of inexhaustible treasures, and from which are continually emanating a variety of substantial blessings that tend to advance the prosperity of the nation, gladden the hearts of thousands, and diffuse life and beauty through expansive regions, heretofore characterised only by desolation and sterility.

The Island of Anglesea affords several valuable mineral products, but their individual importance is by far eclipsed by the extraordinary copper mines in Parys Mountain, near Amlwch. Fifteen brigs, from 100 to 150 tons burthen, besides sloops, were formerly employed in exporting the produce of these mines, consisting chiefly of coarse copper, a richer copper, dried precipitate of copper, ochre, refined sulphur, green vitriol, alum, calamine, &c. The bed of ore in this mountain was in some places 24 yards in thickness, from which the proprietors are said to have raised annually from 18,000 to 25,000 tons of mercantile ore! This wonderful metallic repository was discovered in 1768. The Mona Mines are in the same vein, sometimes 100 yards broad, and occasionally, in this lode, above the copper ore, and not more than three-quarters of a yard beneath the common soil, is a bed of yellow saponaceous clay, one to four yards thick, containing lead ore, and yielding from 60 to 1000 lbs. weight from 1 ton. No less than 57 ozs. of silver are abstracted from a ton of this metal. About six miles from the Parys Copper Mine some beautiful varieties of red and green serpentine occur, in beds of great thickness, associated with the common slate rocks of the district. The red is sometimes intermixed with a great variety of other rich colours in the same stone. For the purposes of ornamental architecture it is held in considerable repute, being, in beauty and durability, not exceeded by the most costly marbles of Italy and the Pyrenees.

Returning now to the main land, we find several copper mines, both of ancient and recent date, on the stupendous slopes of the Orme's Head, which have also produced incredible quantities of ore. At the present period the land is allotted in small parcels, or gales, to the miners, who call the mountain “Welsh California,” the results of some of their “diggings” having well warranted the designation.

[To be continued in next week's Journal.]

SEMI-GRAVITATING STEAM-ENGINE.—There was exhibited on Friday last, before a large party of gentlemen, in Messrs. Scott, Sinclair, and Co.'s foundry here, a novel 6-horse high-pressure steam engine, constructed to drive a thrashing-mill in the island of Islay. The cylinder receives the steam only at the bottom; it is 12 inches diameter; the piston is solid, 12 inches in depth, and metallic packing; the connecting rod is inserted half into the solid piston, and held by a pin; the upper end is connected to the crank in the ordinary way; that with the eccentric wheel and strap and fly-wheel are all the trappings on the engine. The connecting rod and piston weigh 3 cwt., and the fly-wheel 10 cwt.; one-half of its circumference is hollowed out with cores in the inside of the rim—the other is entirely solid. This engine will perform the work of any six-horse power engine, with much less fuel than is commonly used; at the present prices of coal 1½d. per hour will suffice to keep the necessary supply of steam up in the boiler. The engine stands on a small space, and is constructed at one third less price than the ordinary cost of engines, and so simple that any labourer or peasant may easily attend to it. The engine has been invented, constructed, and patented by our ingenious and enterprising townsman, Mr. John Hastie, foreman to Messrs. Scott, Sinclair, and Co., and the smooth and easy manner in which he performed its evolutions gave great satisfaction to every person present, who highly commended Mr. Hastie on the success which his skill had attained in simplifying the use of the steam-engine. We have much pleasure in stating that Mr. Hastie is also patentee of the grain mills which have been for some years in full operation throughout the country.—*Greenock Advertiser.*

ROT IN GALVANISED IRON.—Graham is of opinion that the corrosion of iron in water is in general immediately occasioned by the formation of a sub-salt of iron with excess of oxide, of which the acid is supplied by the saline matter in solution. As a preventive to this, he thinks that “articles of iron may be completely defended from the injury occasioned in this way by contact with the more positive metal, zinc, as in galvanised iron, while the protecting metal itself wastes away very slowly.” It must be here noted, however, that this advice, though theoretically correct, implies the perfect purity of the zinc; for if it contain, as much of it does, either arsenic or sulphur, the very contrary may be anticipated. Arsenic is a much more negative metal than iron, though zinc be somewhat more positive than it, and will, accordingly, on the very same theoretical grounds, decidedly tend to hasten the corrosion of the iron; and as for sulphur, it is well known that in association with iron, it will cause the iron rapidly to rot in moisture, sulphurets of iron readily putrefying, decomposing water, and forming sulphuretted hydrogen on the one hand, and iron rust or oxide on the other. And, indeed, as arsenic is but a metallic sulphur after all, there is not the least doubt that arsenical pyrites, or arseniuret of iron, will also rot just as readily as ordinary pyrites, or sulphuret of iron. It is thus that we would attempt to explain some contradictory testimony on the subject of galvanised iron. The perfect purity of the zinc is a point of great importance.—*Builder.*

LIGHTHOUSE LAMPS.—On Friday evening last three lamps were lighted at the Royal Marine Barracks, Woolwich, one a reflector of the Trinity Corporation, on Captain Huddart's principle 21½ inches diameter, 8½ inches deep, with an argand lamp at 3½ focal distance; the second with a reflector on a plan submitted by Mr. A. Gordon, similar to one he had fitted for the Cape Pine Light-house, on the coast of Newfoundland; and the third on the same plan as the second, with the addition of a set of four annular glass refractors. Mr. Gordon's reflector is 15½ inches diameter, 13½ inches deep, and has an argand lamp at 1½ inch focal distance. The glass annular lenses are arranged at the mouth of the third, their extreme diameter being 33½ inches. The lamps were lighted at 8.30 p.m., and the judges appointed to decide on their merits proceeded to Rainham, in Essex, six miles distant, to ascertain which plan produced the best light. Mr. Gordon's plan, with the annular glass lenses, was the best when viewed full in front; and Captain Huddart's, or the kind used by the Trinity Corporation, was the best when both were tried at an angle of 7° of divergence off the line of the observers. The Trinity Corporation light appeared the brightest as seen from various parts of Woolwich.

LONDON AND NORTH WESTERN.—A memorial from the mayor and inhabitants of Dudley has been presented to the directors on the subject of constructing the railway, which they are empowered to do by Act of Parliament, between Oldbury and Dudley, and which would accommodate a mining population of 50,000 persons, at a cost of 100,000*l.*, and it has been agreed upon by the inhabitants to raise a subscription to compel the company, in the event of their declining, to do it.

hand and the arrears of call on 285 shares. The two last items may be set down in round numbers at 30,000; then we have to add the trifling over 1,100,000 of admitted expenditure, and the sums paid back to the company in hard cash by the owners of Melado, La Luz, and Guadalupe (Catorce). These last sums, amounting in the aggregate to about 70,000, have been, to all intents and purposes, spent twice over; and the account fairly stands as follows:—Admitted expenditure, 1,100,000; and a trifle over; cash repayments from native owners, 70,000; assets in hand and arrears of call, 30,000; equal to 1,200,000.

4. With respect to La Luz. The owners of this mine were under a legal obligation to repay the outlay on St. Bernabé; and the error was merely one of entry, copied, by-the-by, from an Anglo report. The fact, I believe, is that La Luz is a small mine, belonging to the same mining pertenencia at St. Bernabé; and, if this be so, it follows that, had not the directors abandoned St. Bernabé, the company would not have lost La Luz.

5. The observations I made on the Zacatecas adventure, have not been gained; and, if it be true "that the failure arose from causes, in a great measure out of the control of the directors," all I have to say in reply is, that the directors had no business to speculate with other people's money, without having a proper control over the speculation. The would-be accurate secretary, however, leaves unnoticed one omission I made on this subject. Originally, the Anglo-Mexican Company had, as I stated, an interest to the extent of 4000 shares in the Zacatecas Company; but by some *hocus pocus*, the former company was eventually saddled with 5040 Zacatecas shares.—(Vide *Anglo-Mexican Report*, A.D. 1842, page 17.)

6. I never said Asuncion was an unproductive mine; but I classed it rightly among those worthless, or worked-out mines, the expenditure on which had exceeded the receipts; and I repeat that all mines are worthless, to the workers at least, when the outlay, during a long series of years, has in the aggregate been plus—the receipts minus.

The secretary's concluding puff on the acting board is mere *boak*—in fact, the absurd auguries too often blazoned forth in annual reports have only been equalled by the utter lack of judgment and of practical knowledge that have characterized most of the directorial proceedings; and whatever may be the other qualifications of the acting directors of the Anglo-Mexican Mining Company, posterity, if it ever condescends to remember them at all, will certainly not class them as men of business among those "whose memory lives in their merits."

Qui sui memores, alios facere merendo.

Charles-street, St. James's, August 22.

CHRISTOPHER RICHARDSON.

Sir,—Although I have received no instructions from the board to reply to the letter which you have addressed to the Editor of the *Mining Journal* on the affairs of the above company, I think it my duty to correct some of the misstatements embodied in that letter. In the first place (though, of course, this is not a material circumstance), your father is not now the largest registered proprietor in the company; that distinction belongs to our worthy chairman.

2. The appointment of a committee for winding up the affairs of the association, composed of one moiety of directors, and one of non-directors, is simply required by the Deed of Settlement, and the directors are bound to take that measure. It is not, and was never intended to be, a "committee of investigation." In respect to the nomination of this committee for dissolution, it treated with the shareholders to approve the list of persons selected, which they did unanimously. Not one of the parties selected has any connection with the directors, and they were chosen, partly on account of their large stake in the company, and partly for their past attention to its affairs. With respect to an ex-auditor being included, I cannot help thinking, that having been accustomed for years to act in that capacity as a check on the board, no less creditable appointment could be made.

3. You have overstated the amount of capital sunk since the formation of the company. Including the premium on the original shares, the amount is but a trifle over 1,100,000.

4. The mine of La Luz, in Guanajuato, was never worked by the company, and that fact has been more than once stated in the printed reports. San Bernabé was worked and abandoned, and the debt incurred on it was repaid out of the profits yielded by the mine of La Luz, belonging to the same owners.

5. In regard to the money invested by this company in the Zacatecas Mines, there is no doubt that, owing to causes, in a great measure, out of the control of the directors, the undertaking proved an almost entire failure—i.e., a loss of 41. 10s. out of 51. 10s. The board, however, had every reason to believe the mines to be valuable ones, and, under other circumstances, it is probable the speculation would have answered. One of the mines has, if I have been rightly informed, yielded good results since it was given up by the Zacatecas Company; but the capital of the latter was, as you are aware, nearly exhausted, and there was no alternative but to desert.

In regard to the charge against Mr. H. in 1841, the matter was investigated at the time, and the party considered to be exonerated. He did not resign on that occasion. You have classed Asuncion with the unproductive mines worked from time to time by the company; but, in fact, although it has not repaid the entire sum spent on it, it has reduced it very considerably since 1843, and it was the profits from this mine chiefly which enabled the board to pay off the additional capital raised in 1840. In conclusion, I must remind you that ample opportunities have existed, year after year, for arraigning the conduct of the directors, and appointing, if it were thought expedient, a "committee of investigation;" but the good faith and integrity of the board has never been impugned; at least, I can speak for 21 annual meetings which I have attended; on the contrary, a vote of thanks has always been awarded to them. It is true that complaints have been, within the last two or three years, uttered that the company was still kept up; but the explanations have been considered satisfactory, and the discretion of the directors in that, as in all other matters, left unfettered. I must repeat that I have written the above without any authority from the board.

Anglo-Mexican Mining Association, August 14.

BOLANOS MINING COMPANY.

Sir,—In the *Mining Journal* of Saturday last, your correspondent "T" gave a general history of the Bolanos Mining Company from the commencement; winding up by denouncing, as an absurdity, the abandoning the El Bote negotiation at the present juncture. So far, so good. An absurdity it is most assuredly. But why? Singularly enough, your correspondent omits to give more than a sort of *en passant* reply to this. Be it, therefore, my task to enter more minutely into this, to all concerned, most interesting subject.

In the first place, this very inadequate sum of 5000*l*. was advanced for the working of El Bote. This "T" has told you; but can it be too often repeated? Despite the meagreness of its resources, however, the mine in but little more than two years yielded a profit of 50,000*l*. The continuance of this prosperity was, in the minds of the proprietors, so far beyond the reach of a doubt, that they had not even the remotest idea of a draw back; and, the consequence was, that when such natural difficulties arose, as an over abundance of water, temporary fluctuations in the quality and quantity of the ores, &c., to which all such mines, in Zacatecas especially, are subjected, at a certain depth, instead of reflecting that now was the time to render aid, or of, at any rate, cheering on the directors to a renewal of their exertions, the shareholders gave way to the most unjustifiable despair of the concern ever again showing profit, and this too in the very face of the most promising indications a mine could afford. The universal outcry was, "that's the way with all these cursed mining undertakings; this month one's expectations are raised to a pitch bordering on frenzy, only the next to more than fall of realization." This feeling, too, was strengthened by the dissolution of the Real del Monte Company, under widely different and less encouraging circumstances. The result, however, in that case has proved that, with a little perseverance, the shareholders might now be deriving the benefit of the profits the new company in Mexico are making.

But to my subject—Bolanos. The directors pressed onward, battling manfully with every new and more formidable difficulty as it arose; and anxious to avoid the necessity of calling upon the but too evidently unwilling proprietors for monetary aid, they persevered in the sinking of shafts, opening new ground, erecting an engine on San Genaro shaft, undertaking to convey that engine and other machinery from the Bolanos to the Bote, which, after encountering numberless and almost insurmountable difficulties, they effected; erecting engine-houses, boiler-houses, almost brick kilns, blacksmith's shops, store sheds, and buildings of every description, in addition to the necessary and necessarily expensive dead works underground. All this, and much more has been done, the mine, or rather a small portion of it, paying the expenses.

To expect, however, that, unassisted by the shareholders, and bending beneath the burthen of oppressive edicts on the part of the then most tyrannical Government on earth (the Mexican Government), the directors would eventually triumph, was, beyond measure, absurd. Considerable rancour, however, was displayed by the adventurers (?) when, on at length discovering their inability to proceed, the directors ventured to divulge the extent of their difficulties, and to point out the urgent necessity for instant relief.

Now, Sir, herein lies the absurdity. Here is one of the most promising mining properties in Mexico. All necessary erections, including an excellent engine, are effected, and just when the proprietors may be expected to reap the reward of their directors' efforts, they are for sending the whole affair to the devil at once, thereby rendering fruitless all the labour and money expended on it, and leaving it to the original owners to derive the benefit of such an expenditure; all because, forsooth, they are asked to see their own interests in advancing a comparatively small sum, to avert such a catastrophe as the total dissolution of the company. As regards the new issue, the preference of the shares have, before the public, been offered to the original owners, and the result has been a total failure. What now remains to be done? Either to offer it to the public as much as to the old shareholders, which almost amounts to their entire exclusion, or to dissolve the company. That the adoption of the latter alternative may not be inevitable, is the wish of your subscriber—

August 28.

ST. JOHN DEL REY MINING COMPANY.

Sir,—It may fairly be assumed that the letters I have lately addressed to you relative to the above company contain no false statements. Any inaccuracy of importance would, no doubt, have been contradicted through the columns of your *Journal*. I may have been misinformed on some points of detail, and, if corrected officially, should be happy to retract any assertion founded on such information; but no opinion, come from what quarter it may, will shake my firm belief that operations at Morro Velho have not been carried on so as to ensure lasting profits from the mine. So long as profits are large neither shareholders, directors, nor, apparently, managers abroad, consider well the source of the returns, or their probable duration. The answer to every ob-

* I have a right to presume that the whole outlay on Guadalupe has been repaid, as it was in a regular course of repayment, when last referred to in the *Anglo Report*.

servation tending to show the hollowness of present prosperity is—Look at the splendid produce—the glorious produce! I am so well aware of this amiable weakness that I fully expect the returns for May, of which the first 20 days are received, will by some be thought a full and crushing refutation of this letter. The profit for May will no doubt be good, and so will that for June, if the refuse heap last so long; when that heap is exhausted, the stamps will be thrown entirely upon the mine for supply of ore. This will have no good effect—rendering it easy to ascertain exactly how much the mine really does give. At present it is apt to take credit for more than its due, in this fashion—6000 tons are stamped in a month; the mine says, I sent 6875 waggons, which is equal to 5500 tons; therefore, the refuse heap gave 500. Thus every interest which has a defender is complimented on its energy. The mine performance is highly meritorious, the stamps behaved nobly, and the friendless refuse heap is credited the balance. In this there is no exaggeration; the mine account is infallible. In December, 1847, the best and most efficient of the company's officers was removed from the reduction-house, and consequently resigned, because the ore which he said was, and which proved to be, poor the mine agent found it convenient to call good.

The question of paramount importance, what will the produce be after the total consumption of the heap of rejected ore? I will take the number of borers to be the same as last year, 194 (and I believe the average is likely to be less in 1849, as many have died, and at present it is impossible to hire); taking the duty they are stated to have done in 1848, we have 61,672 tons, or 5140 tons per month; thus, at 8-6 olivas (the yield of 1848), we have a produce of 18,500 oits, barring accidents, to follow the 22,000 and odd which have dazzled the understandings of Tokenhouse-yard. This estimate, based upon the correctness of the returns of ore supplied by the mine and refuse heap, does not promise very flattering dividends, when costs in Brazil are nearly 5000*l*. per month. How much worse will matters be if the mine has had credit for more than it gave. That there is some reason to fear this, can be shown by referring to the past reports of the company. At the end of 1842 there was a very large accumulation of rejected ore, more than 6000 tons; but not having this report, I will, to be on the right side, say—

	Tons	3000
In 1843 were rejected	3654	
1844 "	6694	
" bought in	2799	
1845 "	1715	
" rejected	3116	
"	1112	
1846 "	4949	
1847 "	2903	
1848 "	9946	
1849 "	2294	
1850 "	1512	
1851 "	3656	
Tons 10,338		

In April, 1849, 462 tons were bought in, and for 20 days, in May, 500 tons; making 962 tons—leaving in all 9376 tons as existing in the refuse heap, at the time the superintendent expresses his regret that it is fast disappearing. If he be correct, it is as clear as two and two make four, that the mine has fattened many thousands tons of ore which the rejected heap supplied. I have long thought this was the case, but knew it was useless attempting to open the eyes of those interested on this side until the veil was torn off on the other. If I have felt averse to give an opinion on the management at Morro Velho, until the effects of mismanagement became apparent, still more averse am I to be personal in my remarks as to the causes which have led to the present state of affairs. The will alone, not power, is wanting; and if the truth of anything I have written be denied, I ask only for a fair field and no favour—this your columns will supply.

ESTIMATED COST AND PRODUCE OF WORKING A TIN MINE.

Sir,—Feeling a desire to become acquainted with the probable profits to be derived from a tin mine near St. Austle, in Cornwall, to which a company is now in the course of formation in London, I applied to a mining surveyor, in Broad-street, and have received the following estimate of cost and produce of one year's workings, after the ground is opened, as a reply, with liberty to use whatever means I choose to ascertain its accuracy. Knowing your readiness at all times to render practical information for the benefit of your readers, I beg to solicit the favour of its insertion in your next *Journal*; whereby, perhaps, some of your correspondents may favour us with their comments thereon.—X. Y. Z.: *Canterbury*, August 20.

The mine is in the kellas, and the ground stands without timber. From samples taken from the two great tin lodes, at the adit level, it has been found to make an average produce of 4 cwt. of tin to the 100 sacks of work; but as an allowance must be made for poor and unproductive ground, which in the best of mines will always occur, 3 cwt. to the 100 sacks may be considered the safer calculation. One hundred fathoms are to be driven at the 50 fathom level on each lode, which will give 30 fms. backs under the ancient workings. The lodes are 4 ft. wide, and carry tin throughout. There are many branches which will pay for working, but are not taken into account. A cubic foot of lode will make 6 gallons of work, which, at 16 gallons to the sack, is equal to 81 sacks per cubic fathom; then 200 fathoms \times 30 fms. \times 4 ft. = 4800 cubic fathom \times 81 sacks = 324,000 \times 3 cwt. to the 100 sacks = 486 tons of black tin at 40*l*. per ton = 19,440*l*. Produce.

486 tons of tin, at 40 <i>l</i>	£19,440 0
The lode set on tribute at 10s. in the 1 <i>l</i> . or 50 per cent.	£9720 0
Proportion of first working capital, 5 per cent.	972 0
Costs, engine, cost, and carriage, 5 per cent.	972 0
Driving additional levels and cross-cuts, raising air, and sinking whelm-shafts, hauling deads, agents' salaries, 34 per cent.	680 8
Timber and mine stores, &c., 1 per cent.	194 8
New machinery, wear and tear, 14 per cent.	291 12
Unproductive ground, 24 per cent.	486 0
Lords' dues, 5 per cent.	972 0
Management, 14 per cent.	291 12
Net profit	£14,850 0

Being at the rate of 25 per cent.

ABERGWESSIN MINING COMPANY.

At a meeting of shareholders, held at their offices, Bridge-street, Westminster, on Wednesday, the 15th inst., the following report from the directors was read:

We have much pleasure in meeting you on this occasion, as we are now enabled to congratulate you on the success which has attended your exertions, to prove whether lead ore does or does not exist in the property comprised in the leases held by this company. Mr. Couch, the purser, reports that the engine-shaft has been sunk 34 fms., and that a level has at 30 fms. been driven southwards 2 fms. to intersect the north lode, which it has reached, and is now being driven upon. Mr. Couch further reports, that the lode looks very kindly, and that he has driven east 1 fm., and west 8 fms. upon it, and that the lode improves as the works progress; and he further adds, that the 10 and 20 fathom levels are being driven east and west, with considerable improvement in the lode at each fathom. In the prosecution of the works considerable lead ore has been raised, which, when cleaned, will be productive of returns to the company. The directors have considered it prudent to obtain the opinion of Capt. Francis on the present condition and future prospects of the mine, and they now beg to lay his report before the shareholders. For the purpose of carrying on the operations of the company to the best advantage, it will be necessary to call up the remaining capital of 2*l*. per share, and the directors propose to do this by instalments of 1*l*. each, payable on the 1st of Sept. and 1st of Jan. next.

The following report, from Capt. Matthew Francis, was then read:—

Agreeably with your request, I have examined these mines; I find them situated in a line with, and doubtless upon, the great Nantymwyn lead lode, and in similar strata. The engine-shaft is sunk to a depth of 30 fms. under the adit; it is judiciously arranged, the site selected being a ravine or channel of a brook worn into the face of a chain of elevated ground; it would have cost 2500*l*. extra to have sunk the shaft to the same depth from the apex of the ridge of hills; the lode is attended by a large flooken or facing of clay, on the north or hanging wall, and the south part of it contains in considerable quantity sugar spar, lead ore, and blende, which I consider the almost certain signs of a good mine in this district. I would recommend the proprietors to sink the engine-shaft 10 fms. deeper, which will pass into the lode, and probably through it; this will cost 250*l*. Also to drive levels 400 fms. through the lode eastward and westward into the hills, selecting the 20 fm. level, in which, for the last 7 or 8 fms. westward, there is some very fine ore ground, and the 30 and 40 fm. levels, the cost of which will be 1600*l*. or, together, say, 3600*l*. In all probability this work will lay open a sufficient section of the lode to invest the mine with an indisputable character of profit and stability, which I must add the proprietors deserve for their spirited trial. This calculation does not include the necessary dressing machinery, which will cost another 4000*l*.

CONDURROW MINING COMPANY.

The bi-monthly meeting of adventurers was held, pursuant to adjournment, at the account-house, on the mine, on 20th August, when the accounts submitted showed a balance in favour of the mine of 180*l*. 12s. 3d.—The labour cost for June and July was 1022*l*. 17s. 10d.; merchants' bills, 270*l*. 11s. 8d.; dues on ore, 79*l*. 4s. 4d.; and black tin charged on account to end of May, 100*l*.—1472*l*. 13s. 10d.—On the credit side, ores and tin sold, 1584*l*. 6s.; with balance to end of May, of 69*l*. 0s. 1d., gave 1653*l*. 6s. 1d.—showing the balance above cited. The accounts having been received and adopted, the following report from Mr. Nicholas Vivian, the purser, was read, when the meeting adjourned to the third Monday in October next:—

August 20.—An account to day for June and July shows a profit of 111*l*. 12s. 2d., to which should be added the cost of a stamp of eight heads and appliances, say 120*l*. included in the cost for these months. We continue to carry on extensive operations in tinwork—viz.: sinking Pryce's shaft under the 80 fm. level, driving the 80 fm. level east and west, the 70 fm. level east and west, the 60 east and west, the 50 east and west, the 40 east, and a cross-cut north from the 40 to intersect the Llandow's lode, which may be accomplished in the course of a few days; the 30 east, the 10 west, and the deep adit level east on the Llandow's lode, and the same east on the main lode; sinking Woolf's shaft under the deep adit, we have sunk this shaft perpendicularly 13 fms., that is from the shallow adit to the deep, 30 fms. under which level it will intersect the lode—this shaft will eventually become a good working shaft. Hope's shaft we have sunk 90 fms., the engine-shaft 30 fms., and Llandow's shaft 12 fms. The lode is 4 ft. wide in the shaft sinking below the 80, yielding a fair quantity of tin, and there is yet probably a great part of the lode standing to the north. The 70 east is poor, but we believe that

there is more lode to the north, the waste sinking under the 70 east there is a good course of ore, yielding 10 tons per day. This waste is 14 fms. beyond the 80 east. In the 80 west there is a good course of tin, as also in the waste sinking on it, which will be holed in course of a few days. The 70 west is in a good course of tin, yielded upwards of 30 tons of ore of 13 per cent. The 70 west is in a good course of tin, and has been so for several fathoms; the other parts of the mine are much the same as when last reported. The 40 east has been driven 70 fms. with a fine course of tin, and the 50 under this level was productive of tin and ore, the 40 was better, the 70 still more productive, and we are prosecuting the 80 in expectation of yet greater improvement. We calculate on keeping up our samplings of copper ore, and all in all probably increase our returns of tin.

WHEEL SOPHIA MINING COMPANY.

At a meeting of adventurers held at the mine, on the 2d inst., the accounts were produced, showing—Mine cost for May and June, 141*l*. 11s. 2d.; arrears due, 159*l*. 10s.; amount due on 18 forfeited shares, 4*l*. 10s.; amount due on 28 shares, held by adventurers who cannot be found, &c., 110*l*. 6s.—115*l*. 17s. 2d.—By balance in purser's hand 21*l*. 1s. 1d.; arrears due, 244*l*. 10s.; 512 shares, at 5s. 128*l*.—leaves balance due purser, 22*l*. 0s. 1d.—The accounts having been passed, a call of 5s. per share was made.

The following report, from Capt. H. Luke, was read to the meeting:—

The lode in the waste that is sinking from the adit level to the 12 fm. level, and is 10 fms. before the present end in the 12 fm. level east, is greatly improving—we are raising some good saving work. The lode in the 12 fm. level is 4 ft. large, composed of capel, spar, prinn, mundle and rich stones of copper ore. By the time this level is driven back under the waste, we expect a course of ore.

ON THE GEOLOGY OF BISCAY.

The geological map and illustrations of this province, published by M. C. Collette, engineer of the Royal Mining Corps of Belgium, will, no doubt, tend, scientifically considered, to diffuse much useful information on this hitherto neglected field, which previously had not been described by any other native or foreign geologist. He divides the province into two classes—the first containing the lias group in the neighbourhood of Bilbao, and the chalky range which occupies the largest part of Senorio; in the second class is placed the elevations which form the mountain of Axpe, and the different volcanic formations of serpentine and porphyry, which are principally found in the northern districts of the province. The extent of the lias group is but limited. It forms a species of irregular parallelogram—the great breadth of which stretches from the point of Galdacano to the neighbourhood of the mines of Somorostro, and the utmost length from the mountain of Archanda to the south of Bilbao. This district throughout its whole extension is formed of layers of argillaceous limestone, more or less compact, intermixed in a lesser or greater degree with mica, assimilating but little, excepting the colour, with the lias earth of northern Europe, presenting several different forms and transitions, definitively marked towards the neighbourhood of Bilbao, Galdacano, and the point of Bolueta, where it goes over to a compact limestone of an obscure blue colour, easily changed by atmospheric action. In the immediate vicinity of Begona, the limestone of the same group is of a clearer blue colour, but less micaceous, and of a friable structure—the dip of which is about east 20° south; this, however, differs much; sometimes the inclination is in an horizontal direction towards the mountain of Archanda, retaining solely a trivial inclination to the south. In this point, with great facility, the disruption of the stratification which exists between the argillaceous lias limestone, and the liasites belonging to the chalky formation can be seen; these last are in the opposite direction to the mountain—the stratification of which in the line of contact is nearly vertical. The fossils met with in the vicinity of Begona are badly preserved, and appear to belong to the genus *terebratula*. In Galdacano and the point of Bolueta, the fossils are—*ammonites brackenreidii*, *ammonites capricornus*, *ammonites turcatus*, and *torosulus*. There were several other fossils which were not so definitely to be distinguished; there were shells, some conical, some cylindrical, formed by a covering of two or three lines of argillaceous limestone, which enclosed a kernel, or nucleus, of iron pyrites, blended with quartz and limestone, which had some similarity to oolites.

The territory described is supposed to be of the same lias and limestone group which occupies a much more limited extent in the district of Bermeo, towards Mundaca, the characters of which are analogous. In this locality the principal fossils appeared to be of the genus *patella*, corresponding to the *patella papiracea*. About a quarter of a league to the south-east of Bermeo, in the centre of this limestone, a remarkable feature is three small round hills, that have elevated themselves over which the royal highway passes. In these the serpentine presents itself sometimes of an obscure green colour, with small crystals of amphibole, which can scarcely be distinguished from the mass; at other points it is intimately blended with crystals of iron pyrites, and might be considered a specimen of the mineral, denominated *melafira* by Omalius de Halloy. Occasionally the rock presents a more crystallised appearance, and seems to be a confused union of crystals of amphibole, bearing a great similarity to hornblende. The chalky formation occupies almost the whole of the superficies of Biscay, with the exception of the lias groups above mentioned.

In the district of Villaro the rocks are very disordered; in the immediate vicinity they occupy the entire Valley of Arratia, and form two bands, completely isolated—the one situate in the centre of the province, traverses it from north-west to south-east—the other is in the neighbourhood of Ea and Ondarroa. The compact fossiliferous limestone forms a species of promontory adjacent to Lequeitio, and divides itself at this point in two divisions. The first branch terminates in one part, in an almost direct line, which passes to the south of Bilbao, and by the mines of Somorostro, in a north-east direction, and the opposite terminates in a more tortuous direction, but well defined, and parallel to the former, passing by Balaga, Sodupe, and Arata, near Miravalles. The rocks here are composed of blue samite (*psammitis*), blended, but seldom, with calcareous and micaceous sandstone, which alternate with the argillaceous earth, in which is often found spathose iron and siderite, in veins abundant enough to supply the foundry of Povar. Among the fossils there are numulites in great abundance; shells, small and in indifferent preservation—*Acropagia concentrica*, *Pholadomya agassizii*, *Scaluria cancellata*, and others belonging to the *Tusculites* and *Orbitulites*. In the district of Ereno the rocks are limestone, very hard and compact, generally of a bluish grey colour, with an imperfect conchoidal fracture, traversed by veins and branches of crystallised calcareous spar, which run in all directions; occasionally branches are met with small crystals of iron pyrites. At other points the colour is clear grey, or yellow, with a light fracture, and very compact, containing frequently fossils, transformed in crystallised black limestone, so intimately and abundantly disseminated in the mineral mass, that the rock produces a marble with a grey ground, beautifully veined with black, of the same species as that worked at the quarries situated about a quarter of a league to the south-east of the church of Manaria, from which the columns that adorn the Royal Chapel at Madrid were produced. In these calcareous rocks small caves are found, especially in the mountains near Manaria; some, however, are of large dimensions—one south of Dima, in which is the celebrated grotto of Balzola, deserves particular notice, on account of its magnificent stalactites; the entrance, from its extent, and the imposing vista which it affords, forms a striking picture. These calcareous deposits, viewed from a certain distance, present masses of stone capriciously shortened, but elevated to such a height, as to be entirely denuded of vegetation, with the exception of a few trees of the dwarf oak, which appear to be lost in the midst of the rocks. In some of the mountains, particularly those which are sufficiently elevated to have their peaks covered with snow during the winter, and where the thaw is not sufficiently rapid, canals are naturally cut in a semi-circular direction, and opened by the violent and constant action of the under waters. In parts of the rock it is not possible to distinguish the indication of the stratification; in others it is well defined, and dips from east to west, with an inclination which varies in different localities from 20° to 85° south.

VALLEY OF LOETSCHEN MINING AND SMELTING COMPANY.—The proceedings concerning the disputed right to the proprietorship of these mines, which was to have been heard before the civil tribunals, at Sion, on the 10th inst., has been postponed until the 29th, when it is expected that a final decision will be given. The prospects at the mines are encouraging, and there is no doubt that the victors in the litigated cause will come into possession of a more than average good property.

KINGSETT AND BEDFORD.—We last week reported the proceedings at a meeting held on the 6th inst., and the following remarks (which were then inadvertently omitted) may prove interesting to the adventurers.—The meeting was held at the mine, pursuant to official notice issued on the 27th July, when an especial invitation was sent to each shareholder, intimating that a conveyance (the journey being 36 miles) would be provided for all disposed to accept the accommodation. Many of the shareholders, residing in and near Exeter, availed themselves of the opportunity thus afforded them of visiting the mine, whose prospects are represented as of the most gratifying and encouraging character. On arriving there, we learn that some of the party proceeded to visit the neighbouring mine of Wheel Friendship, and, during their lengthened stay, those who came to do the business of the day having only four hours to remain, proceeded to their necessary and legitimate work, and by the time the wanderers had returned the meeting was over, accounts produced, which had been previously audited, and agent's report read, giving entire satisfaction to all present. This circumstance appears to have given some dissatisfaction to one or two litigious persons, which is to be regretted, as the object of the meeting on the mine was to create a general good feeling and unanimity of purpose in carrying out the proceedings of the company. We hear that some important discoveries have since been made, and that, instead of a balance of 5*l*. 2s. 7d. being against the company, there is now the sum of 72*l*. 12s. 6d. in favour—77*l*. 15s. arrears of calls having been since received.

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References.—Dr. D. B. Reid, F.R.S.E., &c., House of Commons, Westminster; R. Prosser Esq., C.E., Birmingham; J. L. Bullock, Esq., Editor of *Fresenius's Chemical Analysis*, Conduit-street, Regent-street; J. Gardner, Esq., M.D., Editor of *Liebig's Letters*, &c., Mortimer-street, Portland-place; and W. Shaw, Esq., Strand, London.

MINING NOTABILIA.

[EXTRACTS FROM OUR CORRESPONDENCE.]

TREBLE CONSOLS, in the parish of Lanivet, holds out great promise of becoming a prosperous and standing mine; the lode, upon which there are four men working, only 5 fms. below surface, is producing very rich work for tin. A water stamp is to be erected on a small scale, within half a mile of the mine, which will enable the shareholders to bring their tin to market; meanwhile, by exploring the other lodes, they will ascertain the proper position for a steam-engine, which will answer the two-fold purpose of drawing water and stamping.

The SOUTH JOSIAH MINE has this week been visited by some of the most eminent practical miners and agents in this neighbourhood, the general opinion being, that it is one of the most kindly things which has been discovered in this neighbourhood since Wheal Maria. There is a lode from 4 to 5 feet big, producing more or less munda and beautiful yellow copper ore; the leading part of the lode is from 1 ft. to 18 in. wide, all good work fit for the pile; the lode altogether will produce from 3 to 4 tons of copper ore to the fathom. The situation of the mine is south from Wheal Josiah, on the Cornwall side of the River Tamar; they have driven their adit about 30 fathoms, and this has given them about 12 fms. of backs; they have a hill before them that will give 80 fms. of backs from their adit level. The river divides the Devon Great Consols Mine from South Josiah. The mine is divided into 256 shares.

SMELTING IN SPAIN.—For some period several parties in Spain have beneficially turned their attention to the smelting of the slag heaps which have been left from old workings long since abandoned. In the neighbourhood of Fuencaiente there are heaps of about 400,000 quintals of slag of an average percentage, being the refuse of carbonates and sulphates of copper; there are others at San Lorenzo, Melanza, and Almodovar, in the province of La Mancha, which contain from 20,000 to 50,000 quintals of a medium quality. At San Celestino, near Almaden, the slag heap is about 50,000 varas square, and is estimated to contain 500,000 quintals of different qualities; a great portion of this is, however, very compact and poor, but some of it is porous, and of malleable lead are often found. Although these establishments are on a smaller scale than those already established in the southern provinces, it is expected they will return a remunerating profit.

ON THE MANUFACTURE OF ENAMELLED COPPER AT CANTON.—When the copper has been shaped into the desired form, it is to be cleaned, but not scoured, and afterwards wetted with water, and sprinkled with the enamelling composition intended to form the ground, which may be either white or coloured. The article is then put in a muffle heated by means of dry Nankeen coal (this is found to be the best fuel). When the ground has been produced, the article is withdrawn from the muffle, and covered with an iron bell, in order that it may cool slowly; the ground may be then ornamented in the same manner as porcelain, and again passed through the muffle. Several specimens of enamel, and colours upon enamel, have been deposited at the Royal manufactory at Sevres, in order that the manufacturers in this kingdom made be made acquainted with the art.

MINING IN THE PHILIPPINE ISLANDS.—In order to encourage the exploration of mines, the governor of Manila has promulgated a code of mining laws; these differ somewhat from those issued in the mother country. Grants of mines not employing four labourers, or working two months consecutively, or four months with interruption in the year, are liable to be revoked. The Inspector of Mines is under the immediate direction of the Captain-General of the Islands, and the General Direction of Mines in the Peninsula. The Tribunal of Appeal from the decisions of the Inspector, is composed of the Captain-General, the Superintendent of the Royal Hacienda, the auditor of the Royal Audiencia, and the Comptroller of the Tribunal of Accounts.

THE MINES OF CALIFORNIA.—We believe there is no doubt that a proclamation was issued by General Smith, of the United States army, forbidding foreigners to dig in the mines of California; but we are led to understand that document, if not formally, has been at least virtually repealed, and chiefly because of the inability of the official in question to enforce his commands. At the same time we think it right to warn our readers that the will to enforce may be dormant until the reception of the necessary strength to enforce, and not entirely dead.—*Times*.

A Man Crushed to Death.—As Robert Adey was waiting with several others at the bottom of the shaft of Haswell Pit, in order to be drawn to bank, the cage having been lowered to within a yard of the bottom, the deceased attempted to get into it before it had reached the ground, and, being in such imprudent haste, put his head and shoulders beneath the cage, instead of letting the bars, and the cage at that moment having descended to the ground, he was severely crushed over his head and shoulders, and died immediately.—*Durham Advertiser*.

YORK, NEWCASTLE, AND BERWICK RAILWAY DOCKS.—At the meeting of the proprietors at Sunderland, on Monday, the report stated that the main dock, now nearly completed, would be opened in the course of the year, and resolutions were passed empowering the directors to conclude an agreement with the railway company for the shipment into the docks of all coal and other merchandise brought over their Durham, Sunderland, and other branch lines.

COAL MARKET, LONDON.

PRICE OF COALS PER TON AT THE CLOSE OF THE MARKET.

Carr's Hartley 16 6—East Adair's Main 13 6—Holywell Main 15 9—New Tanfield 13 9—Ord's Redheugh 14—Ravensworth West Hartley 15 6—Tanfield Moor 13 6—Townley 15—West Wylam 14 6—West Hartley 16 6—Wylam 15—Wall's End Acorn 16 6—Brown's 14 9—Bensham 13 6—Bewick and Co. 16—Brown's Gas 13 6—Gosforth 15 9—Gibson 15—Hilda 15 3—Horton 15 9—Hedley 15 6—Northumberland 15—Hildell 15 6—Wharfedale 15 9—Eden Main 16 9—Lambton Primrose 17—Bradley 17 6—Hedley 18—Hawthorn 18—Hutton 16 3—Jonasbush 15 6—Lambton 17 6—Lunley 16—Morrison 15 6—Russell's Hedley 17 6—Stewart's 17 9—Whitwell 16—Caradoc 16 6—Hodden 16—Hartlepool 18—Hough Hall 16 3—Hesleden 16—Kelley 16 6—South Hartlepool 16 3—South Kelley 16—Thornley 16 9—West Hartlepool 16 6—West Hedley 16—Adelaide Ties 16 9—Covenden Ties 16—Denison 15 9—Seymour Ties 16 3—South Durham 15 9—Tees 17 9—Derwentwater Hartley 16 6—Garnant Stone 22 6—Hartley 16—Nixon's Merthyr and Cardiff 21—Sidney's Hartley 16 6—Ships at market, 228; sold, 158.

WEDNESDAY.—Carr's Hartley 16 6—East Adair's Main 13 6—Ord's Redheugh 14 6—Ravensworth's West Hartley 15 6—Townley 15—West Wylam 14 9—West Hartley 16 6—Wylam 15—Wall's End Brown's 14 9—Bensham 13 6—Bewick and Co. 16—Brown's Gas 13 6—Hilda 15 3—Morrison 15 6—Riddell 15 6—Urpheth 13 6—Eden Main 16 3 to 16 9—Lambton Primrose 16 9—Bell 16 3—Belmont 16 9—Hedley 18—Jonasbush 15 6—Lambton 17 6—Lunley 16—Russell's Hedley 17 6—Stewart's 17 9—Whitwell 16—Caradoc 16 6—Hough Hall 16 3—Kelley 16 6—West Belmont 16 6—Adelaide Ties 16 9—Brown's Downley 16—Clavering Ties 14 6—Richardson's Ties 14 9—Seymour Ties 16—South Durham 15 9—St. Helier's Ties 15—Tees 17 9—West Cornforth 15 6—Garnant Stone 22 6—Hartley 16—Ships at market, 193; sold, 59.

FRIDAY.—Rate's West Hartley 16—Carr's Hartley 16 6—Adair's Main 13 6—Holywell Main 15 9—Hedley's Hartley 14 9—Windsor Pontop 13 6—Ravensworth's West Hartley 15 6—Tanfield Moor 14 6—Townley 14 9—West Wylam 14 9—Wylam 15 3—Wall's End Brown's 14 6—Brown's Gas 13 6—Gosforth 15 6—Gibson 15—Hilda 15 3—Horton 15 9—Hedley 15 6—Percy 15—Sacristan Gibson 15 3—Walker 15 6—Eden Main 16 9—Lambton Primrose 16 9—Hedley 17 9—Hawthorn 18—Lambton 17 3—Plummer 17 9—Stewart's 17 6—Whitwell 16—Casop 16 9—Hough Hall 16 3—South Hartlepool 16 3—West Belmont 16 3—West Hedley 16 9—Whitworth 14 3—Richardson's Ties 14 9—Tees 17 9—Derwentwater Hartley 16—Garnant Stone 22 6—Hartley 16—Nixon's Merthyr 21 6—Ships at market, 128; sold, 70.

THAMES TUNNEL COMPANY

The number of passengers who passed through the Tunnel in the week ending Aug. 18, was—No. of passengers, 13,771.—Amount of money, £57 7s. 7d.

Proceedings of Public Companies.

MEETINGS DURING THE ENSUING WEEK.

THIS DAY.—Austrian Mining Company—offices, at One.
Whitehaven and Furness Railway—offices, at One.
Cornwall Railway—Town Hall, Truro—at Twelve.
MONDAY.—Wiltshire, Somerset and Weymouth Rwy.—White Lion Hotel, Bath, Two.
London and Blackwall Railway—London Tavern, at Twelve.
East and West India Docks and Birmingham Junction Railway Company—offices, at Two.
General Steam Navigation Company—offices, at Two.
Taw Vale Railway and Dock Company—London Tavern, at One.
Newport, Abergeenny, and Hereford Railway—London Tavern, Twelve.
East Indian Railway—London Tavern, at One.
WEDNESDAY.—Kilkenny, Great Southern, and Western Railway—offices, at Twelve.
Newmarket Railway—London Tavern, at One.
Albion Assurance Company—offices, at Twelve.
Phoenix Gas-Light and Coke Company—Bridge House Hotel, at One.
Cheltenham and Oxford Railway—offices, at One.
Belfast and County of Down Railway—offices, at Two.
New South-Western Steam Navigation Co.—Waterloo Station, at One.
THURSDAY.—Direct London and Portsmouth Railway—London Tavern, at One.
Sheffield, Rotherham, and Barnsley Railway—offices, at One.
West Cornwall Railway—King's Arms Hotel, Westminster, at One.
South Wales Railway—Paddington Station, at Two.
Charing-cross Bridge Company—offices, at One.
FRIDAY.—Eastern Counties Railway—London Tavern, at One.
Oxford, Worcester, and Wolverhampton Railway—London Tavern, Two.
Thames Haven Dock and Railway Company—offices, at One.
Norfolk Railway—offices, at One.
Timber Preserving Company (Payne's Patents)—offices, at Twelve.
North Wales Railway—offices, at Three.

[The meetings of Mining Companies are inserted among the Mining Intelligence.]

PESTH SUSPENSION BRIDGE.—This splendid bridge is generally supposed to have been completely demolished during the recent events of the war operations between the Hungarians and Austrians, but, up to the present time, we are glad to learn, from a correspondent on the spot, no serious damage has been done to the structure. The first retreat the Austrian army was obliged to make from Pesth, the general gave orders for the destruction of the bridge, and 60 cwt. of powder were placed on it, 30 cwt. on each side, or under the chains, with the view of breaking them. Both charges were fired at the same time; the person who superintended the arrangements and fired the charges, was literally dashed in pieces. The effect it produced on the bridge was the breaking down of the road, which consists of transverse cast-iron bearers, to a considerable extent. The vibration of the chains was very great, and continued for some length of time; but after the retreat of the Austrians, the bridge was again repaired. The Hungarians, however, were obliged again to retreat over the bridge, when Dembenzki gave orders for its destruction. Mr. Clark, at Pesth, went to Dembenzki, and remonstrated with him, and told him that it would be nothing to his credit, as a general, to destroy so fine a structure. The general told Mr. Clark that his orders were peremptory, but, after a great deal of negotiation, he consented that some of the bearers should be taken down, and put into boats, and taken down to the Island of Schutt, the boats to be scuttled, and sunk in deep water; this was done. Then came the Russian and Austrian armies, when the bearers were taken up, and the bridge again repaired. Several shots have struck the stone-work in places, but no great damage is done.

THE BRITANNIA BRIDGE.—All the fond and desired hopes of a successful realisation of raising the monster tube of this stupendous bridge to its final resting-place are, for the next two months at least, suspended. A few minutes before noon yesterday week, the lower part of the cylinder of the huge hydraulic press on the Anglesea side burst with a tremendous explosion, and in its descent on to the tube, a height of about 84 feet, fell with a terrific crash. The press was at work at the time, and had raised the tube about 3 feet during the lift this day; and had it not been for the very urgent and precautionary means adopted, by packing and bricking under with cement as the tube was being raised, the most dreadful consequences were inevitable. One of the workmen was precipitated from a rope ladder running from the top of the tube to the recess in which the hydraulic machine was fixed; he was struck by the huge mass of iron in its descent, weighing nearly three tons, and now lies in a dreadfully crushed state. I greatly fear that he cannot survive many hours, as the medical attendant on the works considers that, on a close examination of his body, most of his limbs must be fractured, as well as suffering from dreadful internal contusions. Mr. Frank Forster, the resident engineer, with his staff, was quickly on the spot, and I am happy to add that no other accident has happened. This most disastrous affair is to be attributed entirely to a defective coating of the cylinder, and the raising of the tube will, consequently, be delayed some time, until the completion and fixing of the new one in its place. The tube is now raised about 21 feet from the base.—*Liverpool Journal*.—A correspondent of the *Times* says:—"The accident which has occurred at the Britannia Bridge has reminded me of Mr. R. Stephenson's report, submitted to the shareholders a few days back, in which the following passage occurs:—"The progress of the remainder will depend upon the lifting. In this latter proceeding there has been some delay, owing to an unsoundness in one of the large castings of the new hydraulic press in the Anglesea-tower, which occasioned so much leakage as threatened at one time to render a new casting necessary, which would have delayed for several weeks the process of lifting the tube, which has been, as you are aware, floated into its position for being raised. I have, however, the satisfaction of reporting that the leakage has been successfully stopped." &c. Now, sir, when we consider that the casting alluded to is 11 inches in thickness, and worked at a pressure of between 8000 and 9000 lb. to the inch, and that it had, moreover, to raise a weight of 1800 tons, we may be sure it had no child's play to contend with. How, then, could Mr. Stephenson, for one instant, allow such an instrument to be used for such a purpose?"

A NEW BRIDGE.—We have been informed that a new bridge, on the principle of the Besons Bridge, over the Seine, near Paris, has been erected on the Reading, Guildford, and Reigate Railway, to carry a double line over a gully at Albury, the span of which is 50 feet. It consists of five light girders, supporting a wooden platform. The weight of the girders, composed of wrought and cast-iron, does not amount to 10 tons. When tested, this remarkably light structure did not deflect in the middle more than $\frac{1}{16}$ of an inch, with one of the heaviest of the South-Eastern locomotives upon it, and at a speed of 45 miles an hour, the deflection was very little more than $\frac{1}{16}$ of an inch. The principle is the invention of Mr. Neville.

THE HIGH LEVEL BRIDGE AT NEWCASTLE.—This matchless structure, which, like "our glorious constitution," the "envy and admiration" of the world, is now fast approaching to completion. The upper roadway was opened for traffic on Wednesday; and the lower roadway is so far advanced that, on the 2d inst., George Hawks, Esq., of the Gateshead Iron-works, being in Newcastle, and having to attend a council meeting at our Town Hall, drove along the bridge as the nearest road. On Saturday, the 11th inst., Capt. Laffan, the Government inspector, visited Newcastle, to survey and test the bridge prior to the opening. One of the three intended lines of railway had then been laid down, on the east side of the bridge; and along this, in the afternoon, a train ran to and fro for upwards of an hour, consisting of 18 waggons laden with ballast, and four engines and tenders—a Nasmyth and Gaskell, a Longridge, a Stephenson, and a Hawthorn. The total weight of the train exceeded 200 tons—a much greater weight, in all probability, than will ever pass along the bridge again. Messrs. T. E. Harrison, Hosking, W. B. Hodgson, Mackey, Fletcher, Charlton, and others connected with the railway and with the erection of the bridge, fearlessly took their stand upon the roadway, and were present at its trial, not doubting its success; and Capt. Laffan himself, had the bridge come down, would not have "survived to tell the tale." The impression made upon the structure by the train was so small as hardly to be appreciable. An attempt was made to measure the extent of the deflection, but without arriving at any certain result, it was so trifling; at the utmost it did not amount to three-thirtieths of an inch. We have stated that the bridge was "opened" on Wednesday. For reasons sufficiently obvious, there was no rejoicing, ceremony, or entertainment on the occasion. The "turning of a switch," by which the 5 $\frac{1}{2}$ A.M. train was diverted to the permanent railway, may be said to have constituted the "opening." But three or four extra carriages were attached, for the accommodation of those who wished to travel along the bridge in the first passenger train by which this feat was performed. The gentlemen already named were of the number; and also the Lord of the Manor (Mr. C. Ellison), with Lady Vernon, and Miss and Master Vernon, Mr. and Mrs. George Hawks and Miss Hawks, Mr. George Crawshaw (of the firm of Hawks, Crawshaw, and Sons, the contractors for the erection of the bridge), Mr. James Allport, chief manager of the railway, Mr. William Kell, Mr. Ralph Dodds, Mr. Johnson, &c. One of the passengers by the train was Sir Laurence Shadwell, the Vice-Chancellor; and among the spectators at the Gateshead station were Lord Campbell and the Baroness Strathmore, who were on their way to Carlisle.—*Gateshead Observer*.

ENCLOSURE OF TUBULAR WOODEN BRIDGES.—The first in date and merit is that of Schaffhausen, built over the Rhine, where the influence of that river's cataract, a couple of miles lower down, at Laufen, is felt in great force. From its firm construction, it was accounted the best wooden bridge in the world, though the flatness of the banks on each side offered no facilities, and the merit of its projection and construction is due to a common carpenter of the place, called John Ulrick Grubenmann, in 1757. Its entire length was 853 ft. 7 in., without support from below; its breadth was 15 ft. 6 in. With the passage of an individual it vibrated sensibly, but was kept immovable and firm when heavily laden waggons passed over it. The same builder, in conjunction with his brother John, built another hanging and covered bridge in 1778, over the Limmat, near Wittengen, with a span of 346 ft., and with some improvements and greater firmness than the Schaffhausen earlier one. Both were burnt in 1799 by the revolutionary hordes of France, retreating after a defeat by the Austrians.

In more modern times, the art of wooden bridge-building has been carried to great perfection in Hungary by the Austrian road architect, John Gross, who, in 1807-8, built a covered bridge over the Waag, in the county of Thuratz, on the principle of the former at Schaffhausen, which seems to have served as a general model. The most curious feature in these Magyar structures is their small cost; the above was built for only 35,000 gulden, or about 8000l. So cheap is labour and indigenous material in that country, which may almost account for the obstinacy of the resistance offered by it to the Austrian arms, where men are so ready to be procured, and such immense woods exist, to cover a retreat, or to check the operations of an invader.

CHIEF RAILWAY TRAINS.—Two meetings have just been held in Manchester on this subject. At one, resolutions were passed by the church party condemning the practices of running excursion trains on Sunday for the recreation of the operatives; and at the other, resolutions were carried protesting against any such interference as injurious to the health and advantage of the people, the resolutions being embodied in the form of memorials to the railway companies.

RAILWAY COMPENSATION CASE.—On the 10th and 11th inst. an inquiry took place before the under-sheriff and a jury of this county, at the Town Hall, Rualon, for the purpose of assessing the compensation to be paid to G. H. Whalley, Esq., and others, representatives of the late Thomas Watkin Youde, Esq., for the purchase of 1 acre 2 roods 16 perches of land, part of the Plas Madoc Estate, by the Shrewsbury and Chester Railway Company. The amount of compensation offered by the company was only 140l.; but, after a lengthened investigation of nearly two days, and hearing numerous witnesses, the jury brought in a verdict for the purchase of lands, 564l. 15s. 4d., and for residential and other damages, 1800l.—making together 2364l. 15s. 4d.; being more than 16 times as much as the company had offered.—*Chester Courant*.

FOREST OF DEAN RAILWAYS.—The coal and ironworks of the Forest of Dean have presented memorials to the Commissioners of Woods and Forests, setting forth the inconveniences to which they are subject for want of cheap rail communication, to enable them to compete with other districts.

GREAT NORTHERN RAILWAY.—This line is to be completed to Doncaster by the next St. Leger, so that special trains may leave London for Doncaster and return on the evening of that day.

WINDSOR, STAINES, AND SOUTH-WESTERN RAILWAY.—The loop line of this railway from Barnes to Chiswick, Brentford, and Smallbury-green, was opened on Wednesday for public traffic, and the agreement with the South-Western Railway Company came into operation for working the line at a rent equal to 4 $\frac{1}{2}$ per cent. on the cost, and half the surplus profits. The former agreement, which expired on that day, was at the rate of 5 per cent. per annum on the paid-up capital. The London and South-Western Company recently offered to purchase the remaining shares of this company at 4l. premium without interest. The amount expended on the undertaking, up to the 31st July, was 682,049l., leaving a balance at the bankers of 5170l.

THE WINDSOR EXTENSION OF THE SOUTH-WESTERN RAILWAY.—The extension of this line of railway from the present terminus at Datchet to the town of Windsor was expected to have been opened in the course of a very few days—Saturday, it is stated, having been appointed for the Government inspector to proceed over the works previously to this line being opened for traffic. In the course of Sunday, however, an unfortunate occurrence took place, which may probably delay the opening of the line for some considerable period. It appears that the girders of one of the arches of the bridge which crosses the Thames near Eton College snapped, rendering that arch, for the present, most insecure. The masonry and brickwork of the piers are built on caissons of cast-iron, driven into the bed of the river by means of Dr. Potts' patent process, the superstructure above the masonry being of cast-iron. One of the piers, in consequence of the great weight, appears to have sunk several inches, thus causing the snapping of the girder in question. We are informed that considerable fears are entertained that the caissons will sink still further, it being supposed that they are now chiefly resting on a soft bed of clay. Should this turn out to be the case, it appears evident that the bridge must be reconstructed, or at least a great portion of it. It is much to be regretted, after the experience of the brittle nature of cast-iron girders of the bridge over the Dee, on the Chester and Shrewsbury line, that railway companies do not incur the extra expense of constructing their bridges of wrought-iron, and thus, as far as possible, insure the safety of the public.

ENGLISH AND AMERICAN RAILWAYS.—There were about 80 passengers in the train, 40 of whom were in the same carriage as ourselves. "The car," in shape like a long omnibus, has a passage down the middle, sometimes called "the aisle," on the back part of which the seats are ranged transversely to the length of the compartment, which is high enough to allow a tall man to walk in it with his hat on. Each seat holds two persons, and is well cushioned, and furnished with a wooden back, ingeniously contrived, so as to turn and permit the traveller to face either way, as he may choose to converse with any acquaintances who may be sitting before or behind him. The long row of windows on each side affords a good view of the country, of which more is thus seen than on our English railroads. The trains, moreover, pass frequently through the streets of villages and towns, many of which have sprung up since the construction of the railway. The conductor passes freely through the passage in the centre, and from one car to another, examining tickets and receiving payment, so as to prevent any delay at the stations. If we desire to form an estimate of the relative accommodation, advantages, comforts, and cost of the journey in one of these railways, as compared with those of England, we must begin by supposing all our first, second, and third-class passengers thrown into one set of carriages, and we shall then be astonished at the ease and style with which the millions travel in the United States. The charge for the distance of 34 miles, from Boston to Portsmouth, was \$14 each, or 6s. 4d. English, which was just half what we had paid three weeks before for first-class places on our journey from London to Liverpool (34 16s. for 210 miles). Here there is the want of privacy enjoyed in an English first-class carriage, and the seats, though excellent, are less luxurious. On the other hand, the power of standing upright when tired of the sitting posture is not to be despised, especially on a long journey, and the open view right and left from a whole line of windows is no small gain. But when we come to the British second and third-class vehicles, cleanliness, dark, and if it happen to rain, sometimes closed up with wooden shutters, and contrast them with the cars of Massachusetts, and still more the average appearance, dress, and manners of the masses, the wide difference is indeed remarkable; at the same time, the price which the humblest class here can afford to pay proves how much higher must be the standard of wages than with us.—*Lynn's Second Visit to the United States*.

FELL'S NEW SYSTEM OF RAILWAY PROPULSION.—Some interesting experiments were made on Wednesday, at a piece of ground adjoining Frost's rope walk, Shadwell, with the view of practically illustrating the properties of Mr. Fell's invention. In these days of railway depression and low dividends, any improvement which promises to largely diminish that constant element of expense—locomotive power—ought to meet with anxious consideration; and, in this point of view, the advantages offered by the invention in question are invested with peculiar interest. A good sized model was set at work on a line of rails, and every appliance introduced necessary to the complete elucidation of the principle according to which the motive power is produced and applied. The motive power is that of compressed air; a stationary engine communicates with a cast-iron pipe placed between the rails along the whole length of the line, and by this means air vessels of requisite size, placed at certain distances along the pipe, are filled with air of the wished-for density. These air vessels (to speak popularly) supply the momentum to the engine truck, a lever bar attached to the truck opening, as it passes along, a valve or cock, which causes the compressed air to escape into a "chamber" running along the under part of the truck, and thus to become available for propulsion. As the "lever bar" is under the perfect control of the driver, it is evident that the engine truck itself must be rendered completely manageable, for if the compressed air confined in the air vessels be not liberated by the "lever bar," the propelling power is cut off and safety secured. As regards cost, the calculation is, that it will be 50 per cent. less than that of steam. It is said that the invention is susceptible of being applied to railways already in operation, that the present locomotives may be made available after a slight alteration, that there will be neither fire, smoke, nor smell, and that the difficulty of steep inclines will be overcome. We understand that considerable advance has been made in the formation of a company, whose preliminary object is to test the principle in the most rigid manner, by laying down a mile on the heaviest incline that exists in England.—*Morning Post*.

SELF-HEATING SHOT FOR WAR PURPOSES.—We saw, the other day, in the establishment of Mr. Field, tin-plate worker, Argyll-street, a peculiar and apparently most valuable mode of obtaining red-hot shot for large guns. It is the invention of Mr. Scouller, the foreman in Mr. Field's workshop, and consists in the filling the hollow shot with a highly-combustible powder, the composition of which we are not yet at liberty to make public. Two or three fuses are made in the shot, so that, when fired from the piece, ignition takes place, and the shot is made red-hot before it arrives at its destination. In the trial we saw, the shot, which was about 2 $\frac{1}{2}$ inches diameter, was simply laid on the ground, and the composition was ignited by a light applied to the fuse-hole. Violent combustion immediately ensued—liquid fire appeared to stream from its three fuse-holes, and the material became quite red-hot in a few seconds. The inventor states that, when fired from a gun, a red heat will be attained in less than 20 seconds from its leaving its mouth. The composition will burn under water. It is easily made, and there is little doubt as to its efficiency for war purposes, in place of the present expensive and troublesome system of heating, the shot being put into a gun in a cold state, as with ordinary solid balls.—*Glasgow Chronicle*.

THE MINING POPULATION.—The report of the commissioners for inquiring into the state of the mining districts is, so far as Scotland is concerned, very gratifying in its views. The villages are described as agreeably improved in a sanitary point of view; while the men and their employers are happily on good terms, the former making their real or supposed grievances the subject of quiet argument and expostulation. A favourable account is given of the spread of education. The value of the parochial schools is emphatically set forth; and, our wish is, that those seminaries may more and more become places of blessing to the country, as a grand means of its moral and religious improvement. It is exceedingly pleasant to have to notice an improvement in the habits of the mining districts; and we sincerely trust that what has begun, and has gone so far, will steadily progress to the best results.—*Edinburgh Evening Post*.

OPENING THE NEW COAL EXCHANGE.—This splendid building, situate in Lower Thames-street, being now completed, will be publicly inaugurated by the Lord Mayor, on the 3d September, with great ceremony.

PRICES OF MINING SHARES.

. It is particularly requested that all communications may be addressed—
To the Editor

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To the EDITOR,
Mining Journal Office,
25, FLEET-STREET, LONDON.
And Post-office orders made payable to Wm. Salmon Mansell, as acting for the proprietors.

LONDON, AUGUST 25, 1849.

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It would appear that Mr. KENTON BLACKWELL, one of the colliery inspectors or mining commissioners appointed by Government, and who has taken so active and laudable a part in the inquiry as to the causes to which the accident is attributable, with the view of the adoption of some measures which may preclude a recurrence of such fatal results, was fortuitously placed in the district at the time of the accident, so as to enable him, by his presence and actual observation, to acquire that information which could not be gathered from a third party. The interest he has manifested in the present instance gives us some hope, however we despair of any benefit arising from Government inquiries or commissions, the results of which are generally cushioned, or the reports ordered to lie on the table, while heavy items appear in the accounts for the services rendered, that on this occasion at least we shall have a practical report, and that the Government will not permit the question to be dropped—indeed, such we feel assured cannot be attempted after the numerous accidents which daily take place. On referring to the duties and services rendered by Mr. KENTON BLACKWELL in the course of the inquiry, it is only due to that gentleman to state, that a general impression prevailed that Mr. BAKEWELL was the gentleman appointed, who, however talented, is supposed by many not to possess that practical knowledge which is required on the part of an inspector of collieries, who should possess the attainments and abilities of a coalviewer, while he carries with him an expanded mind and general information, as well as the means of applying it, without being guided or swayed by private interests, whose public duties should be devoted to the public interests. The gentleman to whom we have referred, and from whom we hope some better things will result than have arisen from previous Government commissions, was, if we mistake not, interested some two years since in some ironworks and collieries near Dudley; since which period he has made a personal scientific inspection of the coal-fields in the United States, &c., while, to use the words of a respected correspondent, "he combines with 'indomitable energy, high moral courage and character,'"

Having given the evidence at considerable length in another column, may suffice that we close our remarks by directing attention to the verdict given after four days' investigation, observing, at the same time, that the jury were composed of parties doubtless intelligent and conversant with the nature of the proceedings, but a portion of whom only understood the English language; consequently, much delay, and, in all probability, much misunderstanding may have arisen (the latter in such cases most desirable thing), as to the evidence afforded, or the nature of the questions put in the course of the examination. We can well conceive the position of those who were anxious to elicit information, when through an interpreter they were told the witness did not understand the question, the uncertainty attendant on a literal translation, or version, being given to the jury by a person who, in all probability, was unconscious of the meaning of a technical term, or expression, as applied to mines and collieries.

The verdict we consider a true Welsh one, and might as well have been conveyed in the language with which the jurors appear to have been most familiar, so far as we are individually concerned, for it is vague and im-
prehensible. We are told that "the several deceased persons came their deaths by accident, in consequence of an explosion of fire-damp," arising from *some cause or other*. The only part of the verdict to which we attach the slightest importance, is that of recommending for the future that measures should be taken to avert the evil, and that the gas which generates in the old works "should be kept entirely secure from any communication with the '*naked lights*' of the workmen." Why, it does not require four days inquiry, and two hours subsequent discussion and argument, to arrive at this common-place decision. Any old woman, or child, could have at once determined that an accident had taken place, and that it would be better to avoid another in future; but we would ask, what benefit is likely to arise from this prolonged inquiry? Not a single remark made by the jury, for causes we can well understand, on the negligence of the principal, or overman—not a word is said as to fine, or deodand; not such is the case with railways—not a syllable as to the unfortunate widows and orphans. No; the coroner has held an inquest—the jury have returned their verdict—the operations of the colliery will be resumed, fresh hands will be employed—and the miserable victims who remain to mourn their loss may apply to the union. No relief can be afforded the broken heart, but a scanty meal may be given to support life.

would that we could leave the subject without recording, by way of
 warning, a further loss of life, which has occurred in Scotland, and which
 will be found among *our* list of accidents, where nine more lives were
 sacrificed. It is observed in the report, which we copy from a contem-
 porary, not having received the particulars up to the period of going to press,
 that the explosion was caused by fire-damp, that "fragments of human
 flesh and bone have been gathered at 400 yards distance from the pit"—
 "that one of the bodies cannot be recognised, having been "dashed into a
 thousand pieces," while of three the fragments of the bodies only could be
 found. Fortunate it was that the loss of life was confined to the nine
 whose souls in the pit, as at the time it occurred 30 more were ready to go
 down, who must inevitably have met the same fate. Our heart sickens at
 the details, and if we, for the time, close our remarks, it is only with the
 expression of our fervent hope, that those who possess the means, from
 their position in society, to ameliorate the condition of those who are af-
 fected, as well as to adopt active measures to enforce on Government the
 adoption of some measure which may at least have a tendency to avert
 the evil, that we drop our pen for a moment; but shall not leave the sub-
 ject until it obtains the earnest support of the public, and its importance
 is recognised by the Government.

It is with regret, at all times, that we feel it our duty to record policies on the part of agents of mines, calculated to reflect discredit on those with whom they are associated, and, more especially, the mining districts at large, and thus materially injure the mining interests. We have occasionally received "notes from correspondents" as to certain "moves," which we have passed by unnoticed, considering that the parties were too insignificant to warrant as in taking them forward, and giving to them a notoriety, they being noted in their impotent attempts; but an instance has come under our notice this week, which we think deserves a passing remark.

For reasons, which will be obvious to our readers, we omit the names of the parties, and the particular mines referred to, but the facts, we believe, are indisputable. A certain gentleman from the west having during his sojourn in London, while attending to the interests (?) of the several mines with which he is concerned, made the acquaintance of a gentleman from the north, induced him to purchase shares to the amount of some 300*l.* to 400*l.* in one of the mines—there being no operations going on, as we are informed, nor even a cost-book existing. Its cognomen, or title, however, we admit, was of a seductive and attractive nature. The trick, as described to us, is nothing less than fraud, while we congratulate the honest miner in this attempt not having been successful. The game appears to have been artfully played. A broker was applied to, through whose bankers the money was to be paid, and all was considered right; the parties left town; a communication took place; the draft for payment was stopped; and the next move in the affair, we should naturally expect, will be an action to enforce payment, which we assume, however, will not be attempted, as the parties can never have the unblushing effrontery to bring the matter before the public. We have merely adverted to the present case, to put parties on their guard, that we shall ever expose such acts, and endeavour, so far as lies in our power, to protect legitimate mining, and to deery the conduct of those whose only object would appear to be to live on the plunder they can obtain, at the cost, not only of the more wealthy, but to the injury of their more honest and well-disposed fraternity in mining, but not in dishonour.

We last week briefly adverted to the report of Mr. SEYMOUR TREMERE, as one of the commissioners appointed under the Act, 5th and 6th VICTORIA, cap. 99, giving the statistics, which are important, as not only affording evidence of the advance made within the past few years, but illustrating our present position. The report itself is of a lengthened nature, and, so far as we can see, embraces many subjects, and treats upon various points, which we consider are not embodied, or form part of the duties of a commissioner, and thus it is that we have expressed our opinion that he has travelled "out of the record." Mr. S. TREMERE may be, and doubtless is, a sensible well-informed man, with a well-educated mind; but we repeat we consider he has gone beyond the bounds appertaining to his enquiry, in doing which, however, we do not for a moment entertain a doubt but that good will accrue.

We do not blame the gentleman for bringing into action all his powers, or for submitting to Government his views; but we do object, on principle, to any precedent being established whereby a commissioner appointed for one specific object assumes to himself higher powers than those with which he is vested. It was our intention to have placed before our readers an abstract of the report, which embraces upwards of 1500 lines; but we find our space will not admit it on the present occasion, while the condensation of an article of so great a length, treating on one subject alone, requires some care and attention, so as to render it perfect and, at the same time, comprehensive. We much regret that we cannot agree with the theory advanced by Mr. TREMENER, for his report in itself affords the best evidence that it is easy to write but hard to put in practice. Many attempts, we are told, have been made in Northumberland, Durham, Yorkshire, Derbyshire, and other colliery districts; but the results have been attended with failure; a want of co-operation on the part of the coal-owners, and the apathy displayed by the working collier, have deterred those who would willingly have lent their aid in carrying out a measure which has been one of our continual themes—the establishment of a School of Mines; but this must be a Government measure, and Ministers are short-sighted that they do not avail themselves of the examples and advantages afforded by continental states.

Mr. TREMENEER refers to the Museum of Practical Geology as affording facilities; but this is an absurd notion, and only such as we could suppose would be advanced by a *protégé* of Government. How is it to be supposed that the son of a working collier, or agent of a colliery, in Northumberland, Scotland, Wales, Staffordshire, or Derbyshire, can be sent up to London, at a heavy expense, to mix, as it were, with another world, merely to receive the advantages attendant on the lectures, or the readings, of the professors, or those engaged. The idea is perfectly absurd, whether we consider the cost attendant, or the advantages to be derived. Sir H. DE LA BECHE we know to be a man of the first attainments; but he is no practical underground collier, nor has he had the practice of a "butty" or a "faucee-keeper." We may run through the list; and while we may give every credit to Mr. HUNT, as a clever writer and a gentleman of acknowledged application, as well as others connected with the establishment, yet it must be apparent to any one connected with colliery operations, that they are not the proper tutors, or instructors.

It may be said that the knowledge so acquired would be associated with practice, but we contend that such instructions should be in the immediate reality; for, as we have instances weekly, the appliances in one district are not suitable to another. If that the report of Mr. TREMENEER could be placed in the hands of the operatives, his remarks on Chartists and Unionists, moral evils, physical and moral improvement, and the smooth working of society, might have some effect; but to fill up pages which are scarcely read, except by the Government executive only, or when brought forward through the medium of the press, appears to us to be most unavailing for, and to be, as would be designated in ordinary parlance, "making up." We are treated with opinions on water companies, hospitals, barracks, baths, wash-houses, schools, rural police, public-houses, *cum multis aliis*, all of which are fitting subjects, we admit, for consideration in their proper places.

The report, as we have already observed, is of a general character, and saves us at a loss to determine what were the duties of the commissioner, the points to which attention were to be directed. If that it is to be considered but as a "rambling" commission, without any one or more direct objects beyond that of acquiring general information on the various subjects on which the report treats, then we think all such attempts must be failures. We have only to repeat, that if Government wishes a report of this nature to have any beneficial effects in the colliery districts, they could publish it entire, and let it be gratuitously distributed among the operative miners and colliers. This might have some good effect, but the animus conveyed in the shape of a parliamentary report of so general a character, and with comparatively so little practical information is, we cannot but consider, a waste of public money, and the time and talents of the individuals employed.

We have transcribed, in another column, an extract from the City article of the *Morning Post*, on the subject of slave-holding mining companies, and in reply to a letter which we inserted in our last number, from Mr. W. ROUTH, the secretary of the St. John del Rey Mining Company. We do so on two grounds—first, our desire to support all efforts which have for object the total extinction of slavery; and, secondly, because our able contemporary has mooted a question of stirring interest to the labouring miners of this country. He suggests that slave labour should be altogether abolished by these companies, and an effective force sent out from Cornwall. At this moment, when there are so many unemployed able hands in our mining districts, the subject claims most serious consideration on the part of the directors of the companies implicated in the very creditable question of slave labour. Our contemporary proposes a suspension of dividends, or a fresh issue of shares, to provide the capital necessary for carrying out the object. This, no doubt, will be a very unsatisfactory proceeding in the opinion of the general body of shareholders, not only regard the result without reflecting on the means; but no matter what the expense may be, it is a step which ought not unnecessarily to be delayed a packet. The mortality is evidently most frightful amongst these wretched beings; and "Verax," who writes in the *Morning Post*, shows clearly that the blacks are not competent in strength to the tasks imposed on them in boring. We, therefore, join our efforts with our contemporary, in recommending instant and satisfactory reform in the system at present pursued by slave-holding mining companies; and the consequences what they may temporarily, it is a course demanded of all that is equitable and honourable; and that the decrees of these companies may be in accordance with what usually actuates the conduct of British merchants.

Our contemporary is quite silent as to the management at the mines of St. John del Rey Mining Company. We have several letters from critics in Cornwall, formerly employed at Morro Velho, who write very strongly on the point, and declare that the superintendent, especially, is utterly incompetent to the duties devolving on him; and that nothing but the utmost dissatisfaction and discontent exists at Morro Velho. The

lars of meetings &c., of the mines with which they may be connected, on the earliest opportunity, that they may be published in the Journal.

•• We should feel obliged to all purasers, captains, or adventurers, to forward particulars of meetings, &c., of the mines with which they may be connected, on the earliest opportunity, that they may be published in the Journal.

great complaint is, that he was too old a gentleman—being nearly 70—to be sent out, and too long accustomed to the mere office routine as a secretary in London, to take the command of a large mining staff in a country where the habits and customs are wholly at variance with what he had been used to for three score years and ten. We know nothing of the gentleman in question, beyond the fact of his having been secretary to the company in London; but if only one tithe of the statements made in reference to his administration be true, it is high time that a committee of inquiry should be appointed to investigate the whole administration of affairs, both at home and abroad.

A short time since we pointed out some of the causes for apprehension as to the safety of the long-absent expedition under Sir JOHN FRANKLIN, to discover a north-west passage into the Pacific; and we suggested the probability that Sir JOHN RICHARDSON, in his overland search for the gallant commander, would press up in a northerly direction, in the hope that he might, in that middle region, find the expedition in the height of the present summer, endeavouring to make its way south-east or south-west in the open parts of one or other of the two oceans. Shortly after our observations were in print, a letter was received in this country from Sir J. RICHARDSON, giving an account of his progress up to the spring of this year, and announcing, what from general reasoning we had supposed he would do, his intention of travelling as nearly as possible direct north, in the hope of finding the expedition by that course, or of learning what had been its fortunes or its fate. Within these few days we find, from the American papers, that the *Pandora* and *Herald*, which took the long voyage round the Horn, and traversed all the latitudes of the Pacific, and searched the Polar coasts, have returned to the Sandwich Islands, without at all, or in any sense, having achieved the objects of their perilous labours, or lessened the solitude which is felt in England for our gallant and suffering seamen, who have had to endure, if indeed they yet survive the severities of them, four winters passed within the polar basin. Whatever for their relief and delivery can be accomplished, we must rest perfectly sure will be done; but it is to be feared that the safety of the expedition have, from some causes, been grievously imperiled.

We have always studiously avoided giving vent to expressions which might lead our readers to infer that our opinions were in accordance with the particular views entertained by any of the numerous parties who, under several phases and various denominations, have at different periods appeared on the political stage. We should, however, be wanting in our duty, as "faithful chroniclers of the times," did we not on this occasion notice a political event which has given great satisfaction to all classes in the United Kingdom, and which we anticipate is likely to be productive of lasting and beneficial results—not only to the suffering sister island, but to the more prosperous dominions which own the mild rule and benign sway of QUEEN VICTORIA—we allude to the recent visit of her MAJESTY to Ireland. In referring to this event, it is not our intention to enter into any disquisition on the comparative merits or demerits of the Ribbon or Orange factions; nor shall we attempt to discuss any of the political questions, or endeavour to solve any of the doubts, which have perplexed the governing powers who have, from time to time, avowed the destinies of the "green isle of the ocean."

These have been so often discussed in all their various bearings by our contemporaries—almost *ad nauseam*—that, even did our limits allow us to digress so far, we should consider it a work of supererogation; we shall, therefore, as briefly as possible, in an humble endeavour to follow the bright example of our gentle mistress, by carefully abstaining from all allusion to sectarian predilections and party prejudices, offer a few remarks on the sources of wealth which at present are lying dormant in Ireland, requiring but capital and industry to develop them—that they could return a remunerative interest on the sum embarked, and, at the same time, by giving employment to the labouring classes, alleviate that distress which has been the fruitful source of so much misery and crime. In our Journal of the 11th inst., we referred to the experiments of Mr. JASPER ROGERS, C.E., "On Peat and Peat Charcoal." We then recommended his invention to the strictest investigation, convinced that, if only one-half the advantages which he calculated would result from it were brought into practical utility, it would be not only the means of enriching those interested in the speculation, but likewise confer an incalculable benefit on the community at large. As early as the year 1846, we directed the attention of our ironmasters to the importance of using peat charcoal as fuel, as we saw in it the probable means of their being able to compete with the foreign manufacturer of charcoal iron. In the United States, Norwegian and Swedish iron realises a price varying from \$90 to \$110 per ton; while English iron rarely exceeds half that sum. In these two countries, English coke iron, paying a heavy duty, is used for inferior purposes—the manufacturers finding it more profitable only to make superior iron to compete with us in foreign markets.

In England it may be questioned whether peat charcoal could be economically manufactured in sufficient abundance to render it of any permanent benefit to the trade, but this objection does not, in any way, apply to Ireland, which, at the same time it is rich in peat in many districts, contains large and abundant deposits of iron ores and ironstone, not the least remarkable of which is the *Slieve Neenan* (iron mountain), on the eastern shore of Lough Allen, the ores of which, according to Sir ROBERT KANE, are equal to the blackband ironstone of Glasgow; and, according to the same authority, the ores of the Leinster and Connaught coal-fields are equal, and, even in average, superior to those generally employed in Great Britain. In addition to the numerous deposits of iron and the coal-fields, the resources of which have been but partially developed, and the uses of which at present are very limited, there exist copper and lead mines, which have given profitable returns for the capital invested in them; and there is no doubt that some of the deposits (on which great discredit has been thrown, from the jobbing of speculators in London, and other parties interested), if fairly and energetically worked, would have shown different results than, unfortunately, has often been the case. We need not refer here to the unfortunate termination of a mining company in the province of Munster, the details of which are, probably, known to many of our readers. Nickel, antimony, chrome, cobalt, manganese, and other minerals, have been found, but as yet have not been the objects of any considerable or continued enterprise; in various parts of the country marble, granite, limestone, and building materials of every description and quality is met with in great abundance. The facility of transport afforded by the noble rivers of Ireland all point out that, with a little art to assist nature, canals might be made to unite the several lakes and their tributary streams, so as to form one great inland chain of navigation. Some observation on the manufacturing and industrial resources of Ireland might not be inapposite here, but as these are not specially within our province, we shall not trespass on the patience of our readers, by offering any remarks on those important branches of industry, but confine our observations to the development of Ireland as a field for mining enterprise.

Looking at the geological formation of the country, the mineral wealth that has already been discovered (not mentioning the gold mines of Wicklow, but the more sterling deposits of the baser metals), and the possibility of still further discoveries being made, if prosecuted with science and energy, we are surprised that British capital has preferred to seek a questionable outlet in distant and foreign speculations, when it might, in all probability, have found a profitable return much nearer home. When we calculate the immense sums that have been wastefully expended in the exploration of foreign mines, and the concomitant disadvantages attending their workings—such as incompetent management, deficiency in the supply of labour, and general inefficiency when obtained, oppressive and vexatious laws, consequent tedious and expensive litigation entailed on the companies by *contravention of those laws, often in ignorance*, and the general want of knowledge of London directors of the localities they are called on to preside over, generally being some thousand miles from their property, and obliged to trust to the honesty of the parties in command on the spot—we wonder that so many individuals should have been found so readily to embark their capital in these distant speculations. On referring to our Share List, it will be found that these observations are formed not from imaginative conclusions, but stern and melancholy facts. The unsettled state of Ireland may have prevented the investment of capital in many industrial pursuits, but, unfortunately, our principal foreign mining enterprises have been conducted in countries where lawlessness, civil war, &c., have run riot—*as gr. Old and New Spain*. Surely it would have been wiser to embark our capital in a country subject to the same sovereign, and where we ourselves, by our representatives, made the laws that go-

vernored us, instead of risking it in a country where our property might be, at any moment, snatched from us by the rapacious grasp of a military dictator, or the vexatious proceedings of legal harp.

In the end, the Irish labourer has never been found deficient; all are agreed that he is patient and long-suffering, possessing all the elements to become a good and contented workman. The great drawback hitherto has been the want of industrial knowledge; by coming more into collision with the English this will soon be attained; prejudices will be softened, and national acerbities mutually checked, and ultimately extinguished. The visit of the QUEEN, no doubt, will draw more intensely the public attention to Ireland—already tourists are following in her route—the capabilities of the country will be more fully known to the English man of business—not by exaggerated reports, but by personal observation; and we augur the day is not far distant when, instead of sending money to Ireland as an alms, we shall be transporting it thither to fructify and mutually benefit the sister kingdoms. It must not be in British capital and aid that Ireland alone must trust; her main dependence must be in her own industry. The storm is nearly over, a brighter future is dawning, and it rests with herself to profit by the advantages which British capital and connection offer—bearing constantly in mind the concluding sentence of the Report of the Devon Commission, "that the best directed measures of Parliament will not be sufficient, unless aided by the active and steady exertions of the people of every rank and condition in their respective spheres; but much may be accomplished by the united and vigorous exertions of the Legislature and of individuals."

PRODUCE OF LEAD ORE AND LEAD IN THE UNITED KINGDOM, FOR THE YEAR 1848.

By ROBERT HUNT, Esq., Keeper of Mining Records.

CORNWALL.			CARDIGANSHIRE—continued.		
Mines.	Lead Ore.	Lead.	Mines.	Lead Ore.	Lead.
Callington	1057	632	Nanteos	50	30
Huel Mary Ann	334	250	Aberystwith, small mines	20	10
Huel Trevelyan	413	298	Llanymaron	11	5
Huel Trehan	432	279	Llanbadarn	33	18
Herodscotomb	—	—	Bron-berlan	15	7
Herodscot	721	570		4902	3180
East Huel Rose	5333	3191			
North Huel Rose	80	49	CARNARVONSHIRE.		
Cargol	964	578	Llanrwst	—	—
Oxnam	470	387	Penrhyn-da	21	14
Huel Rose	399	239		21	14
Cubert	68	41	CARMARTHENSHIRE.		
Holmshush	154	90	Nant-y-Mwyn	307	264
Leman	—	—			
Great Caltestock Moors	—	—	DENBIGHSHIRE.		
Huel Concord	—	—	Llangollen	—	—
Caltestock	179	110			
	10,494	6614	FLINTSHIRE.		
DEVONSHIRE.			Talargoch	1500	980
Tamar	1022	631	Frontonwag	1895	1168
Huel Adams	96	50	Hendre	1040	638
East Tamar	237	173	Longley	27	16
Huel Friendship	9	5	Mass-y-safn	1138	824
Huel Betsey	6	3	Pen-y-rhoblas	1160	819
Lydford Consols	4	2	Mold Mines	219	153
	1394	844	Long Lake	39	21
CUMBERLAND AND ALSTON MOOR.			Milwr	117	81
Rampgill	424	282	Pen-y-bryn	—	—
Scaleburn	238	156	Dingle & Deep Level	687	645
Carrs & Hanging Shaw	145	97	Barry's Mine	21	13
Capel Cleugh	139	92	Trelogan	15	10
Small Cleugh	31	21	Westminster Mines	659	451
Middle Cleugh	30	20	Halkin Hall	39	26
Long Cleugh	1664	1142	Garreg-y-boethi	6	4
Brownrigg	603	400	Bodelwyddan	106	69
Bentleyfields Veins	35	21	Belgrave	375	261
Cowperdyke Heads	14	9	Bryngwytrog	11	7
Brigburn Veins	244	162	Holywell	—	—
Brownley Hill Veins	227	143	Jamacia	835	599
Beafield Sun. V. E.	119	80	Bwlch-y-ddafryn	20	16
Eng	76	51	Marion	—	—
Blagill Veins	76	51	Gwyn-y-mynydd	18	13
Carrs West of Nent Vein	39	26	Mostyn	18	8
Grass Fields Veins	31	20	Bagillt (ore sold at)	45	29
Galligill Syke Veins	176	117	Billings	45	20
Galligill Burn	24	16	Caellanyraig	14	7
Hudgill Burn	188	120	Mostyn	12	6
Holyfield Veins	38	23	Clwmtilla	26	11
Wellgill Cross Vein	98	66		10,086	7069
Rodderrup Cleugh West	1470	980	MONTGOMERYSHIRE.		
End	—	—	Llangynw	51	31
Tynehead Veins	80	54	Cae-conroy	33	20
Park Grove San Vein	21	14	Rhos-wydol	26	15
Low Birch Bank	19	12	Dwn-gwm, or Dyfawg	13	9
Dowlakeburn West End	95	63	Craig-rhiwair	27	16
Sundry mines under 10 tons	44	29	Belgitt (ore sold at)	45	29
Roughtingill	—	—	Gorn	43	30
Driggliff Beck Waste	30	15	Maehynlleth, including	545	360
Dry Mill Mine	40	27	Delife	19	13
Cumberland	—	—	Nantmelyn	19	13
Greenfields	1660	1200	Frontballan	15	7
Woodend	35	24		927	601
Force Craig	43	32	MERIONETHSHIRE.		
Kewick Mine	20	14	Barmouth	—	—
	8272	5084	Cowarth	74	42
DURHAM AND NORTHUMBERLAND.			Tyddynlwadus	18	12
East and West Allen	19230	9080		92	54
dale and Weardale	—	—	IRELAND.		
Toesdale Mines	3327	2490	CLARE.		
Yarnberry	100	75	Kilbricken	—	—
Silver Tongue	139	95	Ballyhelly	—	—
Dervent Mines	1480	1046	DOWN.		
Stanhope Burn	220	150	Newtownards	616	366
Holly-well	67	48	Conlig	314	179
Lane Head	24	17		930	545
Aller Gill	12	8	LIMERICK.		
Bollihope	13	9	Shallee	340	202
Fallowfield	61	45	MONAGHAN.		
Whitfield	142	105	Bond and Newry	—	—
	18,815	14,658	WICKLOW.		
WESTMORELAND.			Glenmalur	45	39
Dufon and Silverbank	246	184	Luganure	422	295
Hilton and Marton	273	204		467	325
	519	388	WATERFORD.		
DERBYSHIRE.			Barristown	175	116
Sundry Mines	5185	3370		1712	1188
SHROPSHIRE.			SCOTLAND.		
Snailbeach	3463	2436	AYRSHIRE.		
White Grit and Batholes	500	239	Woodhead	450	320
Bog Mine	139	72	Afton Lead Mines	80	56
Pennery	23	15		530	376
Round Hills	—	—	ARGYLESIRE.		
	4130	2702	Stronitons Mines	236	141
SOMERSETSHIRE.			DUMBARTONSHIRE.		
Mendip Hills	41	29	Dumbarton	—	—
YORKSHIRE.			KIRKCUDBRIGHTSHIRE.		
Swale Dale & Arkendale	4053	3040	Cairnsrore	476	311
Conisley	699	437	Cairnsphair	—	—
Grashting, including	—	—	Black Craig	86	58
Garnbury and Coal	1159	707		563	369
grove Beck	—	—	LANARKSHIRE.		
Pateley District	937	609	Lead Hills Mine	300	200
	6848	4793	DUMFRIESIRE.		
CARDIGANSHIRE.			Wanlock Head	960	650
Listburne Mines	2454	1624		2588	1736
Cwm-y-stwyth	120	71	ISLE OF MAN.		
Egair-hir	116	70	Fondale Mines, (in-	1566	1034
Cwm-sebon	31	17	cluding Peel's ship-	—	—
Llanfihir	80	53	ment, &c.	695	461
Gogerddan Mines	243	162	Douglas	260	170
Nant-y-croiau	17	10	Mon	—	—
Pen-y-bont-pren	38	22		2521	1665
Cefn-cwm-bryn	35	24			
Llwyn-malys	51	33			
Bwlch-cwm-erf	40	26			
Bwlch Consols	289	192			

Table showing the Total Quantity of Lead Ore raised and Lead Smelted in the United Kingdom in 1848:—

ENGLAND.			Lead Ore.	Lead.
Cornwall	Tons	10494	6614	
Devonshire	1334	844		
Cumberland	8272	5084		
Durham and Northumberland	18815	14658		
Westmoreland	519	388		
Derbyshire	5185	3370		
Shropshire	4139	2702		
Somersetshire	41	29		
Yorkshire	6848	4793		
Total for England	Tons	55638	39142	
WALES.			Lead Ore.	Lead.
Cardiganshire	Tons	4902	3180	
Carnarvonshire	21	14		
Carmarthenshire	307	264		
Denbighshire	10056	7069		
Flintshire	927	601		
Montgomeryshire	92	54		
Merionethshire	—	—		
Total for Wales	Tons	16305	11122	
IRELAND	1912	1188		
SCOTLAND	2588	1736		
ISLE OF MAN	2521	1665		
Making a total of	Tons	78964	54853	

Lead Ore and Lead Imported and Exported during 1848:—
IMPORTED—1298 tons lead ore; pig and sheet-lead, 3789 tons; retained for home consumption, 2157 tons.

EXPORTED—135 tons lead ore; pig and rolled lead, 4977 tons; sheet, 1181; litharge, red and white lead, 2292; foreign lead, in sheet and pig, 3747 tons.
The Welsh sales include also the following lead ore:—Australian, 69 tons; Belgian, 85; German, 44; Portugal, 79; Prussian, 112; Sardinian, 113 tons.

THE LEAD TRADE.

TO THE LEAD PRODUCERS OF GREAT BRITAIN.

BROTHER MINERS,—The present wretchedly low price of the article we produce must, I conceive, be a source of deep regret, as it is of heavy loss, to most of us; and I venture to address you on the present state of the market, and upon the power which exists of improving it, could we but hit upon some plan of regulating the supply of British lead more nearly in proportion to the demand than has lately been the case. The average annual production of pig lead in Great Britain may be taken at from 50,000 to 55,000 tons, of which fully 45,000 tons are wanted for home consumption. In addition to this quantity, Spain sends annually several thousand tons of hard inferior lead, which contains a good deal of silver, and is smuggled out of Spain as pure lead. The quantity of foreign lead imported has varied considerably, from 1182 tons in 1842, to 3931 tons in 1848. During periods of good foreign trade, as much as 20,000 tons of lead, in various forms, have been exported from this country in one year, but for the last six years an average of only 15,000 tons of British and foreign lead has been exported.

The result is, accumulated stocks and low prices; and the effect upon the miner is to cause him to strive to make up in quantity what he has lost in value or price; he works away upon the best parts of his mine; he stops the poorer bargains, and he limits his works of opening new ground and discovery. It is to be feared that this course of proceeding has been adopted in many cases, and the time will come (indeed, in several instances, it has come) when whole districts will suffer from this impolitic conduct. The price of pig-lead at the outports may now be taken at 15s. per ton of 2240 lbs., which is at least 3s. per ton below the price at which it can be afforded by any but a few of the very best mines.

Under ordinary circumstances, or in usual times, the very low price of the article would have stimulated both consumption and speculation; but there has been little to be hoped for in that way of late; and it is to the falling off in the supply, and to the increased demand which the prosperous state of America, and the improving condition of our own manufacturing districts render probable, that we have to look for an advancement of price; but so long as the miner crowds all the lead he can produce into a heavy market, careless of the result, so long will he have to suffer.

I have shown that, in ordinary years, the production of British lead does not equal the home consumption and the export demand. The deficiency was made up in former years, first by a large supply from the mines of the Sierra de Gador district, in Spain, which are now worked out; and, secondly, by very large quantities sent from the mines of the Missouri, in the United States, which have lately decreased their production very much. The working up of old slag heaps on the coast of Spain, has furnished several thousands of tons of hard lead to France and to this country for some years past; but this source of supply is also diminishing. The British lead miner has no reason, therefore, to fear that these miserable prices will be permanent, nor indeed that they will last long, if he will wisely co-operate and agree with his brother miner to diminish his rate of production for a time, or act upon the principle, without entering into any formal agreement. A moderate effort, if general, would soon produce a considerable effect. A reduction of 10 per cent. of the quantities raised would rapidly tell upon the market.

The remedy is an easy one. The value of the whole of the lead of the United Kingdom raised annually is within 1,000,000 sterling. Any rich and spirited set of merchants might secure the whole, or nearly the whole, and make a handsome profit by a large operation. We destroy all chance of such speculations by glutting the market with excessive quantities, as our neighbours, the ironmasters, do to a far greater extent. The race in lead, if it continues, will be to the strong; the weaker purses, and the poorer mines, must go to the wall; and, in the end, prices will right themselves, in consequence of forced reductions of quantity, instead of a more prudent voluntary and general arrangement.

A movement of this kind should originate with the large producers—Mr. Beaumont, the Governor and Company, Messrs. Wilson, Crowhall, and the great miners of the North, the East Wharfe Rose Mine adventurers, the Snailbeach Mine Company, the owners of the largest mines in Flintshire, Cornwall, Cardiganshire, Montgomeryshire, Yorkshire, and Derbyshire, should meet, and a good and useful understanding might soon be come to. Lead mines, at 20s. per ton for lead, are a good property; but at 15s. per ton profits can be but small, even from the best mines, and by far the largest number continually lose money.

Let me entreat you to act like prudent men, and not madly sacrifice your property. The difference of price, which is all important to you, would be but trifling to the consumer, and the merchant has no real interest in depressing the value of the article he has to sell.

Prudent and skilful miners! husband your resources, limit the scale of your raisings, and

A FEW REMARKABLE FACTS ABOUT ELECTRICITY AND ELECTRIC TELEGRAPHS.—No. II.

BY GEORGE LITTLE.

(OF THE FIRM OF BRITT AND LITTLE, ELECTRO-TELEGRAPHIC ENGINEERS, LONDON.)
"Summa Cuique."

Before proceeding farther with a subject so interesting as that relating to electricity and electric telegraphs, I wish it to be understood that my only object in bringing before you these few matters of fact is simply, in the first place, to direct your attention to the various inventions of those men whose inventive minds have, at different periods, been directed to the improvement of the electric telegraph—not that we are to be bound to their imperfect means of transmitting intelligence, but because there is a certain amount of merit due to those whose mental and physical exertions were the means of first introducing to public notice a discovery for the national benefit. I shall then lay before you in as clear a manner as possible consistent with brevity, the mechanical arrangements of all the various electric telegraphs—some very complicated—others not so; and, finally, to show in what way the great desideratum for an electric telegraph has been happily arrived at. With all telegraphs wherein electricity is employed, it is necessary to have some kind of an auxiliary agent—some sort of audible signal, whereby the attention of the recipient, at a distant station, can be called to his post, so as to obviate the necessity of constant watching. Mr. Ronalds, for this purpose, employed an electrical pistol with his uniformity of time telegraphs, which pistol had, of course, to be charged with an explosive compound, and which would only answer the purpose of calling attention once; it had, therefore, to be recharged every time.

Before anything really useful could be done with electric telegraphs, we had to wait for Prof. Ersted's discovery of the magnetic properties of electric currents—the first discovery of which was communicated by himself in Thompson's *Annals of Philosophy*, vol. 16, p. 273, October, 1820; the substance of which is as follows:—The two poles of a powerful voltaic battery were connected by a metallic wire, so as to complete the galvanic circuit; then taking a magnetic needle, properly balanced on a pivot, as in the mariner's compass, allowing it to assume its natural position in the magnetic meridian, he then placed the wire of the battery through which the electric current was flowing above the needle, so as to be parallel, at the same time horizontal to it, but not touching. The instant this was done, the needle, from the influence of the electric current, changed its position. From this simple experiment sprang the well-known galvanometer, which has of late years been taken advantage of by many persons in the construction of electric telegraphs. On the 25th of September, 1820, M. Arago communicated to the French Institute the discovery that the electrical current possesses in a very high degree the power of developing magnetism in iron or steel. This philosopher was the first to form an electro-magnet, by passing a current of electricity through coils of wire, wound upon bars of iron. The electro-magnet is the basis upon which the whole invention rests in the construction, with one or two exceptions, of all printing telegraphs and telegraphic alarms. In the same year, Ampere, a philosopher engaged upon the subjects relating to telegraphs, predicted the possibility of making the deflections of the magnetic needle answer the purpose of transmitting telegraphic intelligence. In page 19 of his Memoir, he resolves the problem in the following manner:—As many magnetic needles as there are letters of the alphabet, which may be put in action by conductors, which may be made to communicate successively with the battery by means of keys, which may be pressed down at pleasure, might give place to telegraphic correspondence, and would be as prompt as writing speech to transmit thought.

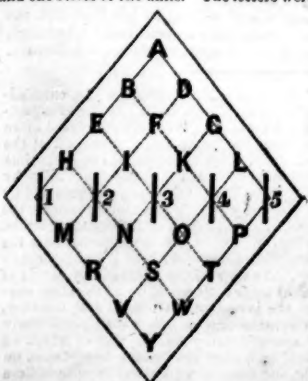
Instruments on that plan were constructed 17 years afterwards by Davy of London, and Alexander of Edinburgh. At first there were some doubts as to the instantaneous transmission of the electric current, whether or not there would be any sensible diminution in an electric current when passed to a great distance, which would render the instruments practically useless when placed great distances apart. Mr. Barlow, some years since, stated that from some experiments of his, he had fully ascertained that there was no sensible diminution when passed through only 200 feet of wire, as to convince him at once of the impracticability of such a scheme. No doubt there is a diminution of the current when passed through long conductors, but so trifling, as in no way to interfere with the synchronous working of the instruments. Most of my experiments were tried by passing the electric fluid through 1000 miles of wire, and I could never detect the slightest difference of time between the instruments, at least not with the eye.

It will now be necessary to explain to those who are not acquainted with the construction of a galvanometer, the way this simple, at the same time useful, instrument is arranged, the invention of which is based upon Ersted's discovery of the magnetic property of electric currents, and which seems to have been taken by many of the inventors of electric telegraphs, as the basis of their instruments. The first galvanometer was constructed by Prof. Schweigger, of Halle, and is constructed as follows:—Upon an oblong reel of wood, or brass (if brass, it requires to be varnished, so as to prevent, by any possibility, the wire from coming into metallic contact, as that would have a tendency to neutralise the effect of the instrument) is coiled a quantity of copper wire, 30 yards or 40 yards, which has previously been insulated, by coating it with a non-conducting material, such as cotton or silk, a space being left in the centre transverse to the coils of wire, so as to admit an axis, upon which is secured two magnetic needles, one of which moves freely inside the coil or reel, the other outside; both needles are fixed firmly on the axis, and so arranged that they swing in hollow centre screws—that is, if the coil be secured in a vertical position; the lower end of the outside needle has a north polarity, the upper a south pole. With the inner needle it is the reverse, the object of so disposing of the poles being to neutralise the influence of the earth's magnetism. For some experiments, instead of placing the coil in a vertical position, it may be placed horizontally, and the needles suspended by a thread of silk, so that one hangs loosely within the coil, and the other without.

On bringing the ends of the coiled wire in contact with a galvanic battery, a current will immediately flow through the coils around the reel, which will have the effect of causing the needles to move at right angles, or nearly so, with the coils of wire; by reversing the wires in connexion with the battery, the motion of the needles will also be reversed.

In a report of the Academy of Industry of Paris, Feb., 1839, is a description of an instrument constructed on the above principles in 1832, by M. Le Baron de Schilling, which consisted of 36 magnetic needles, each of which was placed vertically in the centre of a coil of wire. We are told that M. de Schilling was the first to adopt with this kind of apparatus an auxiliary agent, or alarm, to call attention, which consisted of a ball of lead, so arranged that the first motion of the needles would cause it to fall; it is stated that he used 72 conducting wires for his instrument. In the *Polytechnic Central Journal*, Paris, 1838, No. 31 and 32, is an account of a telegraph invented by Counsellor Gauss and Prof. Wilhelm Weber, of Göttingen, in 1833, which instrument depended upon the deflection of a magnetic bar, weighing 30 lbs. The coil of wire being composed of 80,000 ft. of wire, their mode of passing signals with this single magnetic bar was by the number of motions made, as follows:—Five to the right would signify the letter, A—four to the right, and one to the left, would mean B; three right, one left, and one right, would denote C, and so on throughout the whole alphabet—it being, in fact, a sort of cross counting, which would tend greatly to confuse, at times, the recipient at the distant station. This telegraph was tried at a distance of one mile and a quarter in Göttingen.

In 1837, we hear of the following persons endeavouring to improve on the above—viz.: Prof. Wheatstone and Davy, in London; Professor Steinheil, of Munich; Prof. Masson, at Caen; and Alexander, of Edinburgh. Prof. Wheatstone employed in his instrument five galvanometers, placed in a vertical position upon a frame, and so arranged that the outside needles projected beyond the dial-plate of the apparatus, and always exposed to view. The dial was of a lozenge form, and had marked, at proper distances, 20 letters of the alphabet, and one series of the units. The letters were arranged in the following order:—



In connection was an ingenious contrivance of the professor's, for calling attention to the instrument when about to be worked, which consisted of an arrangement of wheel or clock work, so arranged that on the wheels being set free to revolve, a hammer was made to strike against a bell; the means of setting free the clock work being very similar to that adopted by Morse, in 1832, which will hereafter be described, and for which purpose advantage was taken of the discovery by M. Arago, that the electric current would convert a piece of iron into a temporary magnet on being made to pass through coils of wire

wound upon it. The soft iron was so placed that another small piece, which kept the clock work at rest, would, on the passage of the electric current, be attracted towards it, thereby setting free the clock work to revolve, which in its turn caused a hammer to strike against a bell. There was great ingenuity displayed in the construction; but, from their complicated nature, they were never brought into general use. One or two errors in the apparatus was as follows:—The wire used on the galvanometers was of such a size as to allow the galvanic current to pass silently by, without exerting its influence on the needles, unless a very powerful battery was employed; then, again, the many points of contact such an instrument must necessarily have, tended very much to the forming of imperfect circuits.

With regard to the use of electro-magnets, there are many objections. I have during my experiments upon this subject been greatly annoyed at times through the keeper of the magnet adhering to it for some time after the current of electricity had been cut off, the induced magnetism, from some cause, being still retained in the iron to an extraordinary degree. This, as is often the case, still happens on our lines of railway, where electro-magnets are in any way used. The keeper being retained by the magnet after the circuit is broken, leaving the clock work of the alarms to its full play, ends very often in the destruction of the machinery. Another evil attendant on the use of electro-magnets for this purpose is, that at times, do what you will, by putting on all the battery power possible, you cannot induce magnetism. In the iron this happens frequently after the magnet has been used many times during the day with little intermission. When employed upon the old telegraphs I have been troubled very much this way. Sometimes a flow of electricity, in its downward course to the earth, will envelope the iron, and cause such a derangement, as to render it absolutely necessary to be entirely renewed—in fact, all telegraphs wherein electro-magnets are employed in any way are subject, more or less, to these annoying defects.

[To be continued in next week's Mining Journal.]

Original Correspondence.

IMPROVEMENTS IN SMELTING COPPER.

SIR,—I trust "Germanicus" will respond to the polite request of Mr. Prideaux, conveyed in your last Number. I am sure all who have read the correspondence of "Germanicus" will admit that gentleman's extensive and accurate knowledge of the subject in question; but for myself, even if I were qualified, and however conscientious my remarks upon other persons' improvements might be, still I should feel that an obvious reason precludes me criticising their improvements.

I may mention, however, that about three years ago, when I had no more interest in this subject than Mr. Prideaux, I endeavoured, by a letter published in a West of England paper, to show that the smelting of copper ores "must now undergo a vast change." The correctness of the anticipation seems too well verified by the statistical results of the trade; but were it not for a still greater change now on the eve of accomplishment, I would probably not now refer to this matter. It appears, for instance, that the quantity of copper ore sold by public ticketing in Cornwall, in the year ending the 31st of December, 1845, was 162,587 tons (21 cwt.), the value of which was 919,938l. 6s.; whereas, in the year ending the 30th of June last, the quantity had diminished to 144,983 tons (21 cwt.), the value of which was only 716,917l. And if we take the public sales of July and August, 1848, and compare them with the quantity announced for sale in the months of July and August of this year, we shall find the decrease is still going on; for, in the former period, 27,266 tons (21 cwt.) were sold, while the quantity announced for sale in the same two months of this year is only 24,368 tons (21 cwt.), being a diminution in quantity of 10.5 per cent. Now, in 1845, the exports of copper ore, the produce of South Australia, were only 981 tons 17 cwt., valued at 17,179l. 5s. 6d.; while the exports last year (1848) had increased to 16,323 tons copper ore, valued at 310,172l. Although the duty is now but 1s. per ton of copper ore, instead of 1l. 1s. per ton of metal on colonial ore—a difference of about 4s. 3d. per ton of ore—this reduction is much more than counterbalanced by the reduction of duty upon colonial copper, which was 4l. 4s. per ton; consequently the late reduction of the duties now makes it more favourable for the colonist to smelt his ores on the spot by 3l. 5s. 6d. per ton of copper, besides, which he will, at the very least, effect a saving in freight, by shipping copper instead of ore, of 10l. 10s.—thus making a total saving, irrespective of the advantages or disadvantages for smelting of his locality of 13l. 5s. 6d. per ton of copper. We cannot, therefore, be very much surprised if this valuable metal should be sold (ere many years) at the low price of 50l. per ton, and despite the accumulating quantities, and, therefore, the probable decreasing value of the precious metals. Indeed, little doubt can be entertained that copper, like the other common metals, must fall greatly in value. We know that, in a great mart for cast-iron, this metal was thought in 1832 at a ruinously low price at 4l. 15s. per ton; in the very same place the manufacturer would just now be only too thankful to get one-half the price, which is chiefly in consequence of improvements in the manufacture of that metal. But it would appear, from two circumstances—one being the disastrous effects of over speculations in railways, the other the peculiar constitution of this trade—that this country is now unfortunately destined to follow in the wake of the copper smelters of the United States and South Australia, which is much to be regretted, for all in this country ought (except a few) most heartily to desire improvements should be first worked here on an extensive scale, whether those improvements be in this or any other useful art.

August 23.

WILLIAM BIRKMYRE.

EXPLOSIONS IN COLLIERIES.

SIR,—It is gratifying to find that a well-intentioned suggestion of mine, upon this important subject has, at length been responded to in a proper spirit; and my thanks are especially due to yourself for your co-operation in endeavouring to promote the welfare of the working miner and his family; also to Mr. Richardson, for the dispassionate and honorable way in which he has treated the subject matter, and fearlessly pointed out the too general disposition of those engaged in mining pursuits to condemn and disregard all suggested plans for improving the ventilation of mines, which may happen to be originated by parties unconnected with collieries. Your other correspondent upon this subject last week confirms this to be the fact, when he observes, "If Mr. Colwell imagines that the sagacious miners of the North are to be theorised without a practical test, he will find himself mistaken." &c. Surely this gentleman cannot have read my letters alluded to with any degree of attention, or he would have discovered that my scheme was deferentially submitted for the consideration of persons more competent than myself to approve or condemn; but I had also expressed my anxious desire that my project should be put to the test, &c. Still it cannot be tested in "the Borough-road." In fact, his letter, as a whole, is contradictory of itself, and affords another brilliant example of the insurmountable difficulties persons like myself have to contend with, in order to obtain justice and protection to the working miner. I again most fervently entreat the proprietors generally (and I should hope, in the cause of humanity, one will be found charitable and liberal enough) to construct one of the foul air cells I have suggested, divided midway, so as to prevent the current of air from passing through it; and if the gases I have named are not found to deposit themselves therein (and I will wager your sagacious correspondent alluded to any amount he pleases that they do), I will, without hesitation, acknowledge my error. Its cost would be trifling, and its dimensions according to the discretion and judgment of the scientific viewer, whose sagacity will surely be sufficient to determine its measurement, &c., for this temporary purpose; but I would suggest, in addition to my former description, that the upper part, for the reception of carburetted hydrogen, and all light bodies, should be carried up as high as practicable above the level of the roof of present driftway.

There is evidently a misconception of my impressions, my suggestions, and motives; but I cannot trespass upon your columns by recapitulating what has already appeared therein; I, therefore, solicit an attentive perusal of my arguments. I am fully aware that the gases and the air are blended together, and that they do not perfectly subside into layers according with the specific gravity of each; still I know their natural tendency to be as I have described, and that in some mines the carbon can be caught by holding a jug near the "thill," and all admit that the hydrogen preponderates nearest the roof; it, therefore, appears to me reasonable to expect that a great proportion of these fatal gases would detach themselves from the atmospheric air, and become drifted into these cells. If so (and at present to leave the question of their removal), it seems to me equally consistent to imagine that the subsequent course the air has to take towards its exit it would be less charged with impurity; and if it requires 14 cubic feet of air to one of carburetted hydrogen to dilute it below explosive point, I consider every foot of this gas, stopped in its course, equal to an increase at the down shaft of 14 feet of air. In speaking of the dangers of extreme lengths of air course, I have contended, and still do contend, that the air, by gathering impurities, as it does every yard in its transit, must be most foul towards its exit; hence the necessity of cleansing it, if

possible, at intervals of space. In this it is, that my project differs from all others, and which I still hold in opposition to the present practice of blowing the various gases from end to end of the whole air-course.

It is in evidence, beyond dispute, that in some mines the gas may be heard issuing from almost every pore with a singing noise; I think, therefore, there can be no doubt that, in the absence of any other means of vent, it must be propelled by the passing current of air from the first into the second, thence to the third, and so on, mingling with the previously accumulated gas in each driftway, and, consequently, the air nearest the upcast shaft must be far less pure than in other parts of the mine; and hence an excess of these destructive elements over the estimated quantity of atmospheric air required to dilute them, and consequent explosion, attended with the wholesale slaughter of our fellow-creatures.

Another source of danger is, doubtless, from the accumulation of hydrogen in undulations of the roof, or "swilley's;" but we are frequently told that it can be easily removed from such places when known to accumulate in them; and we find that the poor fellows exposed to its malignant influence, and whose very existence is at stake by its presence beyond a certain extent, frequently beat it out with their jackets from such reservoirs, as a temporary means of protection to themselves; but the distance it has to travel to the upcast shaft, in most cases, is so excessive, that it may deposit itself again in a similar place before it can escape; and a less wary fellow-miner, perhaps innocently, cause the destruction of all; then, why should it not become lodged in a place purposely formed for it, as I propose, particularly as these foul air cells are recommended to be constructed at the end of a drift at the very turn of the current, facing the draft, and additionally attracted by the suction of an air-pump.

There may have been many "funny theories" broached for the accomplishment of so desirable an object as the saving of human life; and these "funny theories" may have produced "many an involuntary smile on the part of some practical men," as it is said, notwithstanding the seriousness of the subject; but, in the course of their experience, the evil so justly complained of, and so laudably sought to be overcome by these "funny theorists," must also have produced a great amount of misery, desolation, and death, to which they have been eye witnesses; therefore, these "funny theorists" in the cause of suffering humanity, must persevere in reminding these scientific men that, in these *funny times*, their old forms and practices must be departed from, if a decided improvement can be established—if the life of an individual only were jeopardised by their continuance, instead of thousands of valuable lives, which are now exposed to destruction by their carelessness, and many almost daily sacrificed through their obstinate prejudice, or absolute neglect. God forbid that this should apply to all on whose management depends the safety of the working men and boys of tender years. I know it does not; they are cared for by many.

In Wall's-End Pit, for instance, no expense has been spared, nor lack of care evinced; they have excellent printed rules for the employed, and which are strictly enforced. The men are visited at uncertain times, and their lamps examined, to see that they have not been disturbed, or trifled with; but whether from jealousy, envy, or self conceit, I know not, and care even less, I feel myself justified, by the spiteful and unmanly opposition of a few to all suggestions tending to improvement, in fearlessly asserting my belief that the many awful catastrophes which so frequently occur have not yet had the effect of moving their obdurate hearts, even to pity the miserable surviving relatives of those good and true men whose bodies have been made the spectacle of horror, as well as sacrifice, in their service, otherwise they would receive a well intended and disinterested suggestion with a better grace.

It is, indeed, time that the Government should throw aside all reservation, and ascertain, beyond dispute, the best mode of ventilation, enforce its adoption, and appoint competent inspectors to see such measures carried out; and I venture to premise that the heartstrings of the public would not be so strained as they now are by the frequent horrifying accounts of these dreadful calamities. Who but such men can read unmoved the testimony of many of the survivors of such visitations, supplicating improvement in cases which still exist, such as one shaft only to supply and evacuate an air-course of 50 or 60 miles, and this said shaft divided, perhaps, into three parts—one for the ingress of air, another for its egress, and the remaining portion for pumping out water? It is monstrous to suppose that in such cases all is done that could be to guard against destruction of human life. I would warn the inhabitants of mining districts to bear this in mind, if summoned on a jury upon such an event, particularly where the managers seem predisposed to adhere to their present mistaken mode of ventilation, and perseveringly oppose all new schemes. Sceptical they may be, but nothing can justify a total disregard of that feeling, which is in itself humane and charitable, or warrant them in responding to it with insult. Disgusted as I am with the wilful imputation cast upon me by the individual designating himself "A Viewer," in your last Number, insinuating that I am actuated by motives which are not purely philanthropic, if my suggestions are really not understood, I again plead my want of ability, rather than intention, to illustrate them; and, therefore, for the further information of those who might be desirous to avail themselves of my humble efforts (and I am assured he is not), I will most cheerfully endeavour still further to simplify them gratuitously to any well disposed person, on application by letter. But permit me, in the first instance, in order to show the animus and wilful misrepresentation of this individual, who is at present nameless to the public, to convict him by quoting a few words from my letter in your Journal of the 14th July—viz.: "These foul air cells to be connected with one main, to be fixed in the side of the centre roadway, in order to guard against damage by the falling in of the roof, or rising of the thill—the branch pipes to the foul air-cells to be fitted with stop-cocks, similar to gas-fittings, so that few or many of them could be acted upon at the same time." &c.

Now, how has this been understood by one who boasts of his sagacity? Take his own words for it; he says—"Mr. Colwell leaves us entirely in the dark as to the size of his pipes, their cost, by what means he will defend them from the constant falls in the roof, how the cocks are to be regulated." &c. It is obviously clear that his letter was not penned with a desire to benefit mankind; but, on the contrary, with a view to disgust me, like many more, into silence, and deter others from presuming to dictate to such learned men. But it will have a different effect upon me; and if your space, for which I am already deeply indebted, and gratefully acknowledge, will not permit me to unmask such persons, I must, on public grounds, resort to other means of exposure; and I may yet convict them out of their own mouths by publishing an analysis of the evidence in the official reports, particularly if they would attach their names to their writings. I have a little leisure, and I think it could not be devoted to a better cause.—C. COLWELL: Borough-road, Southwark, August 22.

VENTILATION OF MINES—SAFETY LAMPS.

SIR,—In the letter which you did me the favour of inserting in the *Mining Journal* of the 4th inst., I did not think it necessary to explain my reasons for using a few grains of gunpowder as a substitute for an explosive mixture of fire-damp when experimenting with the Davy lamp, and the modification of it, devised by Dr. Clanny. I may, however, now state, for the information of some of your readers, that as the physical effects of an explosion are, *ceteris paribus*, always the same, whatever may be the explosive material employed; and as the ignition of a small quantity of gunpowder, or gun-cotton, constitutes a much more convenient and a safer mode of producing an explosion within the wire gauze cylinder than the introduction of an explosive gaseous mixture, I felt fully justified in using either of those agents in a preliminary experiment, such as that alluded to; and since the slight explosion thus produced sufficed to force the flame through the apertures in the wire gauze, there can be no doubt that the ignition within the cylinder of a sufficient quantity of explosive gas will also occasion the same effect. The only question, therefore, connected with this part of the subject which remains for examination is the possibility of an adequate volume of explosive gas existing within the cylinder, at a moment when the upper part of the lamp contains a mass of flame. This question I have not yet been able satisfactorily to determine, in consequence of other engagements having demanded my attention. I find, however, that notwithstanding the innumerable experiments to which reference has been made, the actual amount of mechanical force generated by the ignition of a given quantity of the explosive gas met with in coal mines has not been ascertained, otherwise the solution of this question could be effected by a simple process of calculation. There are some other points connected with the properties and laws of explosive mixtures of gases, which are very imperfectly understood, and the investigation of which could not, I think, fail to be productive of beneficial results to the mining industry of this country.

With respect to particular safety-lamps, the suggestion of Mr. Lake is well worthy attention, as the adoption of a second envelope of wire gauze in the manner proposed by him must render the mass of flame often exist-

ing in the upper part of the lamps now in use less liable to be driven through the interstices of the gauze, by a strong current of air or other mechanical force. Having, however, for some time been of opinion that the construction of safety-lamps has, by no means, arrived at its utmost perfection, I may, perhaps, hereafter trouble you with a description of one which I have ventured to design on a somewhat new principle. I cannot conclude this reply to the letter of Dr. Clanny, contained in the last Number of your Journal, without observing that the style of his communication is not that which I have been accustomed to regard as the most proper for the discussion of scientific questions.

GEORGE ROBINSON.

Newcastle-on-Tyne, Aug. 22.

MANUAL POWER v. HORSE AND STEAM POWER.

ESTEEMED FRIEND.—Startling as it may appear to some unacquainted with the subject, to assert that, under certain circumstances, manual power might be availed of as more economical than horse or even steam-power, I will proceed in the endeavour to prove it so. Let it be supposed that in a level, fenny, marshy, or peat district—say 10 or 12 miles in length—on which there are no natural obstacles beyond streams or drains of from 10 to 12 feet wide on the surface of such a district, I am prepared to prove (by a plan patented) that a firm and durable railway might be constructed without the aid of ballasting, or of requiring ballasting repairs, and thereby avoiding the heavy annual expense in raising and adjusting, as all the present systems require, of sufficient strength to sustain loads not exceeding 5 to 6 tons on four wheels, that such railway would continue firm and effective until time and use produce the natural decay, at a cost, exclusive of fencing and land, not exceeding from 700*l.* to 800*l.* per mile, including requisite stations, &c. Now, let us imagine such a railway made through or upon the kind of land I have mentioned, the land I apprehend would be increased in value far more than the expense. On some districts, for want of a good road, large tracts of land are not worth more than from 10*l.* to 20*l.* per acre, where, if such a road was made, hundreds, nay thousands, of acres would, probably, be doubled or trebled in value, provided this cheap and convenient mode to convey the produce to a market be made, especially in the colonies. The expensive modes hitherto adopted for branch railways through agricultural districts experience has amply proved will not remunerate for the cost, and, therefore, attention should now be directed to more economical modes—so as to afford agricultural and mineral districts the desirable advantage and convenience of railways, made so as to be mutually advantageous to the public and the proprietors. It is time that the talented and eminent engineers should begin to study economy and real utility, instead of adopting costly methods, whereby to prove how they can make art overcome nature, by making costly tunnels, cuttings, and embankments, which might have been advantageously avoided, or constructing bridges and viaducts at two or three times the needful expense for obtaining the desired object, in order, one would think, that their mighty deeds might tend to their advantage, or be handed down to posterity as proofs of what bold talent and a reckless use of money can accomplish.

I will now proceed to show under what circumstances manual power will, or may be, more economical than either horse or steam-power. It will not be disputed that six able-bodied men at a windlass are equal for power to a good horse. Now, it is well known that, formerly on the Edinburgh and Dalkeith Railway, one horse drew 40 to 50 passengers at the rate of 10 miles per hour; and it is demonstrable that the united efforts of eight men, even allowing 25 per cent. off for friction of machinery, would propel, or draw, the same amount by each man exerting a power equal to lifting 35 lbs. $\frac{3}{4}$ ft. high per second, which it is allowed a man can exert for 10 hours per day; the same proportion of power exerted by eight men will propel, or draw, 5 to 6 tons at the rate of (say) 12 miles per hour, or double that load, at half or four times at a quarter of that speed. It is, therefore, not unreasonable to suppose that a gang of eight men would accomplish 96 miles in one day, which is equal to the power of eight good horses; and the reason is obvious—because the men do not tire themselves by having to carry their own weight like the horse. The utmost disadvantage they labour under is the friction of 4 or 5 lbs., occasioned by their own weight on the engine or carriage.

Having stated thus much, I will proceed to detail the advantages and disadvantages of the several systems. To make a railway adapted for horse-power, a firm road must be made for the horse track, which would make an extra expense of about 250*l.* per mile; so that a horse railway, even constructed on the plan I propose, would cost from 1000*l.* to 1100*l.* per mile; and to keep the same in good repair would, I imagine, not be less than 15*l.* per annum per mile. To work the same by steam, although it would not require the horse track, yet the extra cost of the engine, extra wages to the engine-men, and the well-known expense in wear and tear of the engine, I apprehend would be fully equal to the disadvantages of the horse track; so that I think they may be put upon a par in that respect. Now, let us imagine a road of this kind made through a district of (say) 12 miles, having a surrounding population of from 15,000 to 20,000, residing within the compass of 6 to 8 miles of its locality; I think it is reasonable to suppose that the traffic would amount to 150 each way per day, provided the charge does not exceed $\frac{1}{4}$ d. and 1*d.* per mile, which would be 300 per day over 12 miles. Now, if the united efforts of eight men would convey 40 passengers the distance in one hour, then, by making eight journeys in a day, 40 passengers each time would be 320. Let us now suppose that the 12 miles of manual railway cost, including all expenses, 10,000*l.*, and the horse railway 12,500*l.*, the comparison may be thus stated:—

Capital Account.	
Cost of construction of manual road.....	£10,000 0 0
Cost of engine.....	100 0 0
Cost of carriage (for passengers).....	250 0 0
	£10,350 0 0
Working Account.	
Dr.—To interest on capital.....	£217 10 0
Wear and tear on stock, 300 <i>l.</i> , at 25 per cent.....	75 10 0
Eight men, at 2 <i>s.</i> per day.....	375 10 0
Balance, or profit.....	1858 15 0
Total.....	£2737 10 0
Capital Account.	
Cost of constructing a horse railway.....	£12,500 0 0
Cost of engine.....	150 0 0
Cost of passenger carriage.....	250 0 0
Total.....	£12,900 0 0
Working Account.	
Dr.—To interest on capital.....	£245 10 0
To wear and tear on stock, of 410 <i>l.</i> at 25 per cent.....	102 10 0
Keep of 8 horses, at 15 <i>s.</i> per week.....	332 0 0
Annual repair of road, at 15 <i>s.</i> per mile.....	180 0 0
Balance, or profit.....	1477 10 0
Total.....	£2737 10 0
Capital Account.	
Cost of constructing steam railway.....	£10,000 0 0
Cost of engine.....	700 0 0
Cost of passenger carriage.....	250 0 0
Total.....	£10,950 0 0
Working Account.	
Dr.—To interest on capital.....	£247 10 0
Wear and tear on stock, 900 <i>l.</i> —25 per cent.....	225 10 0
Cost of fuel, labour, &c.—25 <i>s.</i> per day.....	450 10 0
Balance, or profit.....	1498 4 0
Total.....	£2737 0 0
By 300 passengers, at 6 <i>d.</i> each.....	£2737 0 0

Thus, it appears, that manual power, under the circumstances stated, would be much more advantageous than horse or steam-power, as the following comparison exhibits:—

By gain by manual power.....	£1858 15 0
By ditto with horse-power.....	1477 10 0
By ditto with steam-power.....	1498 4 0

I, therefore, think, as far as respects power and other advantages, manual power is, at least, 50 per cent. cheaper than horse or steam-power to accomplish a given amount of work. I am quite aware, if there should be traffic sufficient, that steam would do at least double the work in the same time, causing only the addition of about 2*d.* per mile for fuel. It will be perceived that the foregoing comparison is only to show the results of a given quantity of power to accomplish the same amount of work under the same circumstances, not as a calculation of profit or loss of a railway project, although it might form a basis on which to found an encouraging prospectus. Now, if manual power is as cheap, or cheaper, than horse-power, is it not desirable to employ it, instead of applying the produce of the land for the support of horses?—more especially where there

is a large unemployed population, as is the present case in Ireland, and even in many parts of England and Scotland.

I will conclude by observing, that I think the past experience in railway making amply confirms the view I entertain as to the rule that ought to guide in constructing railways, which may be thus explained:—Suppose it be deemed desirable to construct either a turnpike-road or a railway over a level district, of say 12 miles, and imagine the difference of friction to be eight times in favour of the railway—viz.: that one engine on a railway will do as much as eight will do on a turnpike-road, then, doubtless, it would warrant an outlay eight times greater to effect the railway. Telford estimated the cost of making a good turnpike-road at 1000*l.* per mile, and to keep it in good repair 50*l.* per mile per annum, the difference may be thus stated:—

Turnpike-road.		Railway.	
Cost of turnpike-road.....	£12,000	Cost of railway—say.....	£120,000
Ditto of eight engines—say.....	8,000	Ditto of one engine.....	1,000
	£20,000		£121,000
Interest on 12,000 <i>l.</i>	£ 600	Interest.....	£ 6,000
Wear and tear of engines—25 p. ct.....	3,000	One engine.....	1,000
Repair of road.....	600	Wear and tear of engine.....	150
Four engine-men.....	300	Annual repair of railway, at 15 <i>s.</i> per mile.....	180
	£3,500	Two engine-men.....	150
			£6,580

It will be seen I have allowed a double set of engine-men for the turnpike road, who will have to go four times each oftener than the railway, which, I presume, would be a greater public accommodation. By the foregoing it appears, admitting both roads to be level, that the difference in favour of the turnpike road is nearly 100 per cent., which, I imagine, will most amply compensate for the ordinary undulations of turnpike roads, and that, therefore, from 10,000*l.* to 12,000*l.* per mile is the prudent limit for the cost of ordinary railways; otherwise the time may come, and I think will come, when steam on common roads will successfully compete with railways that may have cost from two to four times that amount.

Entertaining these views 10 years ago, I did all in my power to prevent lavish expenditure on the Bristol and Exeter Railway, but so spell-bound were the directors and shareholders, that my exertions were but little heeded; though I believe I was a great means of saving them many tens of thousands, at a sacrifice of much time and many hundreds of pounds, which the contractor for the works of the line will, and the directors can, confirm. The original estimate for that line was 1,250,000*l.*, and which amount, if the original plan, gradients, &c., had been adopted, might have been amply sufficient, but which has ended in a cost of about double that amount, notwithstanding considerable alterations that were subsequently made in gradients, &c., after my exertions and statements were published.—THOMAS MOTLEY, C.E.: Stangate, Lambeth, 8th mo. 21.

SCOTTHORN'S ROTARY-ENGINE.

SIR,—It appears to me that "An Engineer" has overstated the advantages to be derived from the use of Scott's rotary-engine, as described in your two last Journals. The same plan was patented by a Mr. Andrew Flint so far back as 1805, and again by a Mr. Wilcox, of Bristol. What success attended these engines I do not know, but that they are precisely similar to Scott's may be seen by referring to Stuart's or Galloway's *History of the Steam-Engine*.—IRON: August 21.

PATENT LAW REFORM.

REPORT OF THE COMMITTEE ON PRIVY SEAL AND SIGNET OFFICES.

SIR,—In the *Mining Journal* of the 11th inst. you give the substance of the recommendations of the Privy Seal and Signet Commission, in so far as patents for inventions are concerned; and, after honouring my endeavours to procure some substantial reform in these matters with commendatory notice, you express a hope that inventors and patentees will not let the matter rest here, but continue to press it upon the Government, until some real amendment is effected. But, although the commission above-named has pointed out some amendments which, if carried into operation, will render our patent system more protective, both for inventors and the public, still I doubt very much whether the majority of your readers will be able to see the importance of the proposed reforms, unless their bearing and effect be further explained to them, so little being generally known with regard to the details of the present patent system.

The minutes of the evidence taken before this commission, and published with their report, very fully explains the details and character of the present system of granting patents, and the following passages will, I think, explain the remedial effect of the amendments recommended in the report:—

Mr. F. W. CAMPBELL examined:—Having traced the patent through its successive stages, will you state whether you think the present mode of granting patents is a convenient one?—My opinion is, that it is not so convenient as it might be made, undoubtedly; but I think it is a matter of perfect indifference to patentees and inventors; what they look at is the expense; it matters very little to them what arrangements the Government choose to make in public offices, so that they get their rights insured to them in a perfect manner, and at a small cost.

Would it be possible to obtain less delay?—There is only one way to do it, and that is by dating the patent from the day that a person applies for it.

Is the applicant for a patent ever damaged by the interval which elapses between the first application and the sealing of the patent?—Yes, he is sometimes, and the more so by the present system at the Designs Office. A person sometimes registers a design—it is a short process—and this operates in this case precisely similar to a person taking out a patent.

Will you describe in what manner an applicant for a patent receives injury from the delay that occurs according to the present system?—By some one getting knowledge of his invention, and not thinking it worth while to take out a patent, and bringing it out and exhibiting in his shop to the notice of the public before the date of the seal, or by registering under the Designs' Act between the interval which elapses.

What is the usual interval between the application for a patent and the sealing of it?—About a month.

Does it often happen that the exclusive right to a patent is anticipated, as you have described?—Not very often, I should say.

Supposing all fees upon patents were abolished, and a simple stamp duty upon a patent were substituted, what ought to be amount of that stamp duty?—I beg to say that I am in favour of the same policy as that pursued in France, of taking the duties by annual instalments of moderate amount. The greater part of inventors are in reality men in very humble circumstances—the real inventors; and, although, you find manufacturers have frequently been the persons taking out the patents, those things have been in many cases originally worked out by some of their workmen.

You think there ought to be an annual tax upon a patent?—Yes, and my object is this, that you shall not give a patent for trifling things, so as to induce people to take out patents for worthless things, but at the same time to afford to a poor man facility for getting his invention protected, that he may not lose it by the circumstances of his position.

Supposing a patent were granted for seven years, how much would you make the duty payable each year for the whole three kingdoms?—About 10*l.* a year.

Is there any other suggestion you would wish to make?—Yes, that every party should deposit at the time of the application an outline description of his invention, which should be binding as to the principles of the invention, so that he shall not merely make a bare statement of certain improvements in so and so, and then go about and collect from everybody, perhaps persons having patents already, their ideas, which he places in his specification afterwards.

Would it be possible to embody the specification in the original grant?—Not the specification itself, because you are bound to give in a specification of the exact and correct details of the invention, and there is no one who can give these until he has ascertained the nature of the experiment and research, and after building models of engines, and so forth.

You would suggest that an office be established to which the public could have access?—Yes; the Commissioner of Patents in the United States publishes every year a report of that kind of all patents that have been granted arranged in that way. At which office do you think it would be desirable that this register should be kept?—At the Great Seal Office—the Lord Chancellor's Office.

THOMAS WEBSTER, Esq., examined:—Supposing the number of the fees was considerably diminished, and that they were payable only at two or three stages in the progress of the patent, according to your recommendation, do you think it desirable that there should be one gross sum, in the nature of a stamp duty, payable upon the patent when it is sealed, or that that payment should be annual, according to the French system?—I think I would combine the two; but I have not much considered that. Nothing can be worse than the present system; and I think if the price is to be kept up, that it would not do to require it to be paid in one gross sum, for this reason, that persons might like to have the advantage of going to a certain stage, and if so, they ought to pay for that. If an invention becomes abandoned before the Great Seal, he has that protection, and he ought to pay for it up to that stage. Therefore I should not recommend one gross sum by way of stamp duty, though the cheapest to collect, especially as you must have some intermediate offices; but I would press upon the attention of the committee the policy of annual payments. I think it is a very good principle indeed.

I trust the above quotations will show inventors and the scientific world, who are most deeply concerned in the important questions involved in the subject of protecting inventions, that the recommendations of the committee are worthy of their countenance, and induce them to support me in another attempt to induce the Legislature to amend the law of patents, which I purpose shortly to do. One point, passed over very lightly in the report, is of very high import, and deserves to be pressed upon the Government—namely, the providing the law officers of the Crown with full power to adjudicate in cases of opposition, and the appointment of competent scientific assessors to assist them in all cases where their assistance may be required, or desired by the parties. At present the Crown officers may call in such aid if the parties be willing; but no confidence can be reposed in persons called on *par hazard*, and who are bound by no official tie to a proper fulfilment of their duties. Indeed, in practice, the aid

of a scientific referee is so seldom resorted to, that such a character may be deemed a *rara avis in terris*, whose existence has wondrously been brought to light.—F. W. CAMPBELL: Patent Office, 210, Strand, August 22.

FRANKLIN COXWORTHY'S DISCOVERIES IN NATURAL PHILOSOPHY.—No. IV.

In controversy of the assumptive doctrine of the diffusion of gases, we have shown that it is at variance with the universal law of gravitation; that, when closely investigated, it does not account for the restoration to the atmosphere of the gases disengaged from it during combustion and respiration; and that if, under the influence of the assumption, we contemplate such of the other phenomena of nature as the restoration to the earth of the carburetted hydrogen evolved by the decomposition of vegetable matter "chaos is come again." But strong as may be considered the evidence we have already adduced—decided as may be the *argumentum ad absurdum* to which we have reduced the doctrines of "diffusion"—there is another fact to which we will refer, of itself sufficient to overthrow the fallacy.

Liebig, and other chemical sages, long since determined, by actual experiment, that ammonia is invariably contained in both rain and snow water; and, admittedly without sufficient examination, accounted for its presence by assuming that the ammonia must be collected from the air by the rain and snow in their passage from the upper regions, and by which the atmosphere became purified of this gas, liberated or diffused into the air during the decomposition or putrefaction of matter—although matter does not putrify during that low state of the temperature in which snow reaches the earth. But, as far as we have been enabled to trace, neither Liebig nor any other of those who have concurred with him, had been satisfied, by actual experiment, that the water precipitated at the termination of a shower or storm contained the same proportion of ammonia as that which fell at the commencement. The importance of such an experiment had been frequently alluded to, and its necessity thence inferred. If, for instance, at the conclusion of a fall of rain of some hours duration, a palpable difference could be found in the quantity of ammonia held in solution, the theory—to that extent only—might be worthy of further examination. And if not, as we confidently believe to be the case, neither suffusion nor infusion will prevent the utter demolition of doctrinal "diffusion." On a subject of so much interest, we are astonished that Liebig, at least, did not bestow the indispensable examination of experiment. He was bound to prove an affirmative assumption—such extreme importance; especially as it was offered in corroboration of his own opinion. We are satisfied that both are equally groundless.

Our readers will be aware that it is to the ammonia held in solution that rain-water is indebted for its peculiar softness—for a semi-soapaceous smoothness of feeling when we have our hands in it—for its application to domestic purposes to which other water cannot be so usefully applied without the addition of ammonia or some other softening material. Ammonia, indeed, is excessively soluble in water; and it is evident that the rain, after showers of considerable duration, if Liebig were correct, could obtain no ammonia from an atmosphere already deprived of it by preceding showers. And, by the same rule, showers falling at long intervals ought to be laden with infinitely larger proportions of ammonia, than those pouring down continuously sometimes for days and nights together!

In the absence, then, of any evidence on the part of Liebig to sustain his hypothesis, we cannot do otherwise than accept the testimony of Franklin Coxworthy to the contrary; albeit he has not had the requisite appliances to prove the negative in the most conclusive form—actual analysis. As far, however, as taste and colour, and lavements and other manipulative applications could be carried by him, repeatedly and most attentively, he declares that he can discover no difference whatever in the essential properties of rain water, caught at the commencement or conclusion of showers of varied durations, in any season. A fact which is to the same extent discoverable by any of our readers. Thus an assumption arrived at by those who concurrently admit that its proof is important, has not been proved by them, or, as far as we can learn by others, is denied on the basis of inductive reasoning as being an improbable adjunct to an impossible hypothesis; and that denial is supported by the best attainable experiments. Now, no such fallacies as those we have been endeavouring to dissipate are necessary to the doctrine propounded by Franklin Coxworthy, of which we have already given the premises. He assigns to the formation of snow the combination, in the upper regions, of the gases of vapour (oxygen and hydrogen), the nitrogen liberated by combustion and respiration, and the carburetted hydrogen evolved by the decomposition of vegetable matter. And, as previously stated (in No. 3.), the fuel consumed in this country, annually, is alone equal to the liberation from the atmosphere of about 380,000,000 tons of nitrogen; and as, by the conversion of this gas into ammonia, it combines with about one-fifth of its weight of hydrogen, we have thus formed about 456,000,000 tons of ammonia.

Concluding this portion of the subject, we have to observe that the habitable world contains about 1,000,000,000 of human beings, a large proportion of whom are located in latitudes wherein the consumption of great quantities of fuel is necessary for the production of artificial heat; and in all latitudes fuel is requisite for household and manufacturing purposes. If, therefore, 28 only out of this thousand millions liberate from the use of fuel alone a quantity of nitrogen equal to the generation of about 456,000,000 tons of ammonia, there can be no difficulty in comprehending that the general use of fuel, accidental conflagrations, artificial lights, the explosion of "villainous gunpowder," volcanic eruptions, &c., added to the constant respiration and other animal functions of the myriads of warm-blooded creatures, biped and quadruped, should generate ammonia to an extent equal to what may be brought down in the rain upon the entire surface of the globe, assuming that every drop contained its due proportion. Believing this, we need not suppose, that as "the early bird catches the worm," so the early shower must catch the ammonia! Or that Nature shall so vary her laws, that some showers shall but partially or not at all perform the functions assigned to them; but, defrauded of their fair share of ammonia, be allowed to descend unfruitfully to the earth, or otherwise less personally useful to mankind.—We shall return to this subject.—Cheltenham Journal.

IMPROVED METHOD OF TEMPERING EDGE TOOLS.—For heating axes or other similar articles, a heating furnace is constructed, in the form of a vertical cylinder, the exterior made of sheet-iron, lined with fire-brick, 4 in. diameter, or of such outside diameter as to give it an inside one of 4 ft. and 3 in. high. In the interior of this cylinder, several fire chambers are formed—usually four. The inner wall of each fire chamber is 18 in. long, 4 in. from front to back, and about 4 in. in depth—forming, in the whole, a circle of 3 ft. 4 in. diameter. Under each there are grate bars, and air is supplied through a pipe connected with a blowing apparatus. A circular table of cast-iron, 3 ft. 4 in. diameter, is made to revolve slowly on the level with the upper part of the said chamber. This chamber is sustained on a central shaft, which passes down through the furnace, and has its bearing in a step below it; a pulley keyed on to it serves to communicate rotary motion to the table. When the axes or other articles are to be heated, they are placed upon the table, with their bits or steels parts projecting so far over its edge as to bring them directly over the centre of the fire, and the table is kept slowly revolving during the whole time of heating. When duly heated, they are ready for the process of hardening. The hardening bath consists of a circular vat of salt water; within the tub or vat, a little above the surface of the liquid, is a wheel, mounted horizontally with a number of hooks around the periphery, upon which the axes or other articles are suspended. The height of the hooks from the surface of the liquid is such as to allow the steels part only to be immersed. As soon as the hardening is effected, the articles are removed from the hooks, and cooled by dipping in cold water. With the best cast steel, a temperature of 510° Fahr. has been found to produce a good result, in hardening in about 45 minutes.—Scientific American.

THE SEWAGE OF LONDON.—The following plan has been submitted by Mr. Matthias Dunn to the Metropolitan Commission:—In the neighbourhood of Newgate-street, a place selected as being the highest ground in that part of London, Mr. Dunn proposes to sink a shaft and erect a powerful engine. The bottom of this shaft, it is proposed, should be connected with the Thames at low water, so as to afford an unlimited supply. The water, when pumped up, to be delivered either upon the streets or into the principal sewers, and to be directed from place to place by means of plank doors. The engine chimney to be very lofty and spacious, and by drawing the air used for the boiler fires exclusively from the sewers, a most powerful and natural ventilation will be kept up, and instead of the stench nuisances discharging, as at present, up the gratings and at the mouths of the sewers, the atmospheric air will rush in and carry them with it out at the chimney top. The above establishment would operate to Farrington-street on the west, towards the very eastern parts of the city, and down to the river, and should the trial be found to answer the desired end, other similar establishments might be ordained. The cost and practicability of the plan can be closely ascertained, and all the main sewers be made immediately available, after which the minor sewers ought to be connected therewith, and participate in the advantages of such a sweeping system of cleansing.

Seven cases of bar gold, value about 75,000*l.*, received from St. Petersburg by the steamer *Victoria*, *via* Hull, were paid into the bank on the 21st inst. by Mr. Oliver Lyndall. The amount received per *Camilla*, on Saturday last, was 90,000*l.*, on account of the Russian Government.

TAKE HOLLOWAY'S PILLS IN CASES OF DERANGED HEALTH, OR IMPURITY OF THE BLOOD.—This inestimable medicine is a superior remedy in all cases of derangement of blood to the head, benumbed feeling in the limbs, impaired health, impurity of the blood, drowsiness, swimming in the head, disordered stomachs, loss of appetite, bad digestion, and debilitated constitutions. The number of persons cured of these ailments by Holloway's pills is incredible, and many of them had been for a long time suffering, and had failed to get relief from medicines prescribed by the first doctors in the profession. A steady course of these pills will restore the most debilitated to a vigorous state of health.—Sold by all druggists, and at Professor Holloway's establishment, 244, Strand.

